

MAKING BETTER MOVIES

ACL

Paul Appleton, M.D.



ARTHUR L. GALE and
RUSSELL C. HOLSLAG

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MAKING BETTER MOVIES

BY

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AND

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A publication of the
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WHY THIS BOOK?

An amateur movie camera opens for its owner a whole new world of interest and satisfaction. Like every good hobby, personal movies bring immediate rewards and an increasing repayment for the increasing effort devoted to them. There is no painful period of floundering among the "a b c's" of making personal motion pictures and there is no possibility of exhausting their capacities in a few short months or years. Here is an avocation for a lifetime.

Few recreational activities are as rich and varied as amateur movie making. The initial equipment is inexpensive and the periodical supplies are within the reach of everyone who has any money at all to spend on his pleasures. Movie making is both mental and manual, indoor and out, individual and collective, a good weather and a bad weather sport and an avocation that appeals to young and old. It is healthful and constructive. It lends itself very quickly to practical and serious application and it can bring the maker financial rewards.

The new movie amateur first wants to convince himself, by personal trial, that his camera will "work" and that he can, at once and without previous training, make it work. The production of professional and theatrical movies has, ever since motion pictures became generally popular, been veiled in a cloud of mystery for the average person and we have accepted, too readily, the concept of movie making as a very specialized and abstruse practice performed by a very special and unusual kind of person. Very few new industries have entrenched themselves into

a technical fortification as has the theatrical movie industry. Some of this intrenchment has been a necessary protection against swarming hordes of curious persons; most of it has been highly effective advertising. A technical jargon has been created and ordinary English has been laid aside for special terms to make the whole movie making process sound extremely complicated and difficult.

The operation of an amateur movie camera to take interesting motion pictures is a very simple process. There is nothing like the difficulty attendant upon learning how to ride a horse, use a bicycle or drive an automobile. One does not have to develop any automatic reflex actions or to learn any new bodily postures. Anyone with even subnormal muscular coordination can use an amateur movie camera. Success is bound to result from the simple process of doing a few definite things in regular order unhurriedly. Failure almost invariably is caused by getting "flustered" or by speeding up the few things that are to be done, in an effort to manipulate the camera in the offhand fashion that so many of us seem to think is a mark of superior ability.

The purpose of this book is to clear away any of the remaining mystery of movie making on an amateur basis and to discuss making better amateur movies in the natural order in which we approach them. It is, therefore, broken up into chapters devoted to the newcomer, the average amateur, the developed movie maker and the advanced practitioner. This method of discussion lacks some of the advantages of grouping information under such heads as Exposure, Focus, Portraiture, Continuity, Tempo and others that have developed as the terminology of photography and photoplay production. However, an index is added to make ready reference easy and chapters are broken up into topical discussions as an aid to the quick location of any particular bit of information. The advantage of the present chapter division lies with the aver-

age person who comes into amateur movies with no previous experience in photography or professional movie work, and that average person is far greater in number than the one who is already a trained photographer or motion picture employee. This book is written largely for the average amateur and it departs deliberately from tradition in the way it presents what it has to offer.

A word about the authors will not be out of place. Arthur L. Gale, now editor of *MOVIE MAKERS*, has since 1927 been the continuity consultant of the Amateur Cinema League. Russell C. Holslag, now advertising manager of *MOVIE MAKERS*, has since 1929 been the technical consultant of the same organization. These men have answered more individual problems, submitted by practicing amateurs, than anyone and they have, as a result, developed a knowledge of amateur difficulties and amateur needs that is unexcelled. They have replied to an average of fifteen thousand amateur questions each year. Necessarily, in this process, they have had to recatalog and revalue the earlier concepts of terms and of methods of giving aid to amateur cinematographers. Starting from the traditional photographic and photodramatic viewpoints inherited from still photography and the professional screen, they have blazed new trails and have established a new and—happily—a more simple technology of which the Amateur Cinema League is proud. This book represents their contribution to the practice of amateur movies, made as they advance to larger responsibility with their organization.

In presenting this book, the Amateur Cinema League offers it, above all else, as a service volume designed to accomplish practical things for men and women who are fundamentally untechnical and who believe, as the League believes, that making personal movies is no abstruse thing but, on the contrary, an entirely practicable and perennially delightful human occupation. It is published for the benefit of the members of the League and it is probably unnecessary

to remind those members that the consulting services of their organization are continually at their call, upon demand, to discuss more fully the things that this book may have covered too briefly as well as any other problem that League members may face.

ROY W. WINTON
Managing Director
Amateur Cinema League, Inc.

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CHAPTER I

AT THE THRESHOLD

Handling your camera This chapter will outline those basic steps by means of which the amateur will make his first progress along the road to good movies. After he has viewed his first films, very possibly made with more enthusiasm than definite attention to any principles, he begins to realize that some further improvement is possible. Now is the very time to consider how these improvements may be brought about by the primary mastery of a few easily understood first principles of camera handling.

Film types and widths

Amateur motion picture film is a strip of sensitized material on which pictures may be taken and which consists of a *base* of cellulose composition, upon which is coated an *emulsion* of silver compounds in gelatine; this emulsion makes the film sensitive to light. Amateur film may be classified, as far as sensitivity to light is concerned, into (1) a *semichromatic* type that requires fairly bright light for taking good pictures, (2) an *orthochromatic* and a *panchromatic* type, both of which require less light, and (3) a *supersensitive panchromatic* type that requires the least light. Obviously, the film requiring the least light may be more universally used and is, therefore, the most serviceable in poor light, although it is the most expensive. The adjective, *chromatic*, means "capable of render-

ing color differences in a scene, in terms of black and white tones." The more pronounced the chromatic qualities of a film, the more faithfully it will render on the screen in tones of black and white the variations, for example, of a dress that has both red and black material.

Almost all amateur film is sold to the user with the understanding that it may be sent back to the maker for a special treatment, known as *reversal*, from which this kind of film is referred to as *reversal* or *reversible*. By this process, the film, after it has been run through the camera to take the picture, is sent to the manufacturer who so treats it chemically that it is made ready to put into the projecting machine, to throw its images on the screen. An amateur may secure film to be used only as a *negative* (a film which, when developed, exhibits all of the black and white tones of the scene in their opposites and which may be used as a master film to print other films for screening); with this negative he takes pictures. The negative is then developed and, from it, a separate film is printed; this film is known as a *positive* and is used for screening. While this method of operation provides the filmer with a negative from which he may have innumerable prints made as often as he pleases, it is more expensive, requiring the purchase of two separate films; furthermore, motion picture laboratories must be specially equipped to produce good results with this process and such are to be found only in the larger cities.

Because of the appearance of a new film system on the amateur horizon, in recent months, the principles of camera mechanism and *threading* (putting the film into the camera mechanism so that you are ready to take pictures) may, broadly speaking, be separated into two general divisions, one involving 16mm. film (9½mm. and 35mm. being operated on the same principles as 16mm.) and the other involving 8mm. film. Since 16mm. film has provided the basis for amateur film terminology, it might

be well, for purposes of comparison, to take it as the basis for this discussion of film measurements. In comparing 16mm. film with the more recent 8mm., unless the principles are fully explained at the outset, references to the two film systems may constantly tend to confuse the reader. Therefore, a full explanation is offered.

In the 8mm. system, the film that is delivered to you from the laboratory for *projection* (throwing the image on the screen by running exposed, developed and printed film—generally referred to as *processed film*—through the projector, or machine for screening) is exactly 8mm. wide and carries down one side a single row of *perforations* (holes in the film to engage the camera and projector mechanisms). Since this film is but 8mm. wide, it follows that the width of each separate *frame*, or picture on the film, is much smaller than the corresponding frames of 16mm. film. In fact, the 8mm. frame is but half the width of the 16mm. frame and, therefore, is only half its height. This being the case, twice as many 8mm. frames will occur in a linear foot of 8mm. film as in a linear foot of 16mm. There are forty frames to a foot in 16mm. and eighty frames to a foot in 8mm. film. This means that, in the *finished film* (film that has been taken by you and processed by the manufacturer) the equivalent in 8mm. of a given footage in 16mm. will be exactly half, so that, for a certain length of projection time, twice the length of 16mm. film will be needed as of 8mm. Consequently, whenever reference is made to a given footage in 16mm., there will follow in parentheses its equivalent footage in 8mm., both lengths of film giving the same projection time. Thus, ten feet 16mm. is equivalent to five feet 8mm. and five feet 16mm. to two and one half feet 8mm.

However, another point must be considered with reference to the comparison of 8mm. and 16mm. and that point involves the *raw film* (film that has not yet been exposed to light and on which, therefore, no picture has been

taken) as it is sent through the camera in the process of making movies. 16mm. film is run through the camera by the same straightaway method that is used in its projection; the same holds true of 9½mm. and 35mm. But conceive *two* 16mm. films run through the same camera side by side, and we have a system analagous to that used in employing 8mm. If the two 16mm. films were then joined together side by side and we had a camera so built that, by running this double film through it, a row of pictures down one side only could be taken, after which a row could be taken down the other side, it is easy to see that a given length of this "double picture" film would contain twice as many pictures as "single picture" film would carry. Now, let us put our imaginary double film under a reducing glass so that its width will appear to shrink to 16mm. The film will still contain a double row of pictures, but each one will be less than 8mm. wide and proportionately high.

Here we have the condition that actually obtains in so called 8mm. film, while it is being used in the camera. From our discussion above, we saw that an 8mm. film, bearing a single row of pictures, would contain twice the number of frames in a foot. Hence, a given footage of 8mm. film would last twice as long. But *in the camera* we employ a double row of pictures, so that a given footage of the unused "double 8mm." film contains not twice, but *four times* as many frames as the same footage of unused 16mm. film. This will aid the reader in understanding why the camera equivalent in double 8mm. film, unused, or "Eight film," as it will hereafter be called, is such that a twenty five foot length of "Eight film" is equivalent to a one hundred foot length of 16mm. After the "Eight film" is run through the camera, it is processed, slit in half, lengthwise, and returned to the user as a true 8mm. film, joined end to end consecutively and bearing perforations down one side only. Therefore, when directions for taking

a certain amount of footage to secure a particular view are given and when suggestions are offered about cutting and *splicing* (melting film together by a chemical process) film returned to you from the processing laboratory, the parenthetical amount of "Eight film" will be one half that of 16mm.

Because "Eight film" work is less expensive in apparatus and raw stock, it should not be assumed that it is undeserving of the attention of the serious film amateur. Bearing a panchromatic emulsion of high quality, this film will provide a screen image which is satisfactory in every way, its only limitation being that it cannot be magnified on the screen to proportions as large as those of 16mm. It is in every way worthy of the serious attention of those who would create new things in the medium of the amateur cinema and is susceptible to all of the directions and operating principles given in this and later chapters.

Preparing the camera

The first step in mastering the threading of the camera, or placing the film properly in the camera mechanism, is to study the instruction book carefully. One of these comes packed with each new camera and it should be carefully preserved as a reference, if any doubtful point should arise later. For the rest, a study of the following diagram will repay the reader; this shows in basic form all of the important principles of camera mechanism. A trial "film" of paper or other material is supplied with the new camera and this should be threaded and rethreaded until the operator is sure of the method. Special attention should be given to three things, first, that the *teeth* of *sprocket wheels* engage the film perforations correctly when the *rollers* are in place; second, that the film is properly seated in the *gate*; third, that the film is securely attached to the hub of the *takeup spool*. (See diagram for identification of these cam-

era parts.) If possible, try threading with actual film as well as with the paper dummy, if the trial length provided is not, itself, film. A short length of old film may easily be procured for this purpose.

Essentials of the motion picture camera

(Refer to diagram)

A. Upper or feed spool. In loading the camera, this spool, which contains the raw film, is put in place first.

BB. Pressure or idler rollers. These rollers keep the perforations in the film engaged in the teeth of sprocket wheel (N).

C. Upper loop. Provides correct amount of slack in the film to allow for the step by step or intermittent motion imparted by the claw (H). (See K.)

D. Film gate. A spring pressure is provided which is just sufficient to hold the film steady between each successive movement.

E. Aperture. The opening which defines the area of the picture. The image formed by the lens (G) is focused on the sensitive emulsion of the film through this aperture.

F. Shutter. A revolving segment so timed that it cuts off the light from the lens (G) during the period in which the film is being moved to a new position by the claw (H).

G. Lens. A combination of suitably ground circular elements of optical glass which bends light rays to form an image. The lens axis (XX) also passes through the center of the aperture. The tube in which the lens elements are mounted is called the lens barrel.

H. Claw or shuttle. The teeth or pins which engage the perforations in the film and move it downward through a

distance equal to the height of one picture.. Also called the *intermittent movement*.

K. Lower loop. Performs the same function as the upper loop. (See C.)

M. Take up spool. The spool which receives and automatically winds up the film after it has passed through the camera mechanism.

N. Feed and take up sprocket. A toothed cylinder which engages the film perforations and by this means provides a positive control for the film in passing through the camera. In certain cameras this function is performed by two separate sprockets.

O. The film.

XX. Lens axis. An imaginary line drawn through the center of the lens which also passes through the center of the aperture perpendicular to the plane of the film at that point.

A short description of the camera in operation

Starting from the feed reel (A), the film is drawn with a steady pull by the sprocket (N), turning in the direction of the arrow. It is then fed steadily into the gate (D), at the same rate at which the intermittent (H) operates, thus maintaining the upper loop (C) constant. The lower loop (K) is constant for the same reason. The film is stationary and is exposed to the image formed by the lens (G) when the claw (H) is withdrawn from the perforations. At the instant when the claws project through the slot and enter the perforations in its edges, the film begins to move downward; the shutter (F) revolves so that its opaque sector cuts off the image from the film. When the claws are withdrawn from the perforations at the end of its downward travel,

the film again comes to rest, exposing a fresh surface at the aperture (E). At the same time, the opaque sector of the shutter has now passed the lens, and the stationary film again receives the lens image. This cycle normally takes place sixteen times a second in amateur cameras. Since half of each cycle is taken up by the film travel, the duration of each period in which the film is exposed to the image formed by the lens is normally about $1/32$ of a second.

Loading and unloading

Try to avoid loading—putting film into the camera—in direct sunlight. The “daylight loading” spools are effective in protecting the film, but, with the *fast* emulsions now available, even a small amount of light may fog the film, so that it is better to load the camera in the shade, in a spot sheltered from the bright sky, indoors or under a dark coat or garment. (“Fast,” when applied to film, means having much sensitivity to light.) In preparing the film for threading, do not pull off too much of the paper or other *leader* from the roll, as the danger of fogging is thereby increased. (A leader is a short protecting length of paper or insensitive film at the beginning and end of a fresh spool.) The same precautions should be followed in unloading the camera after the picture is *shot* (a slang term meaning to take a picture). At all times, keep the film wound tightly on the spool; if it is allowed to come loose while you are handling it, danger of fogging will be incurred. A little practice will show how, in threading, not to use too much of the leader. All that is necessary is enough to pass through the camera mechanism, with a turn or two around the take-up spool. Run the camera for a few seconds with the cover off, to observe if the leader is going through the mechanism properly. The paper leader is threaded so that its black side is toward the *lens*. In the case of certain kinds of supersensitive film, which have no

paper leader, the position of the camera spool will automatically regulate the proper placing of the film in this respect.

Setting the diaphragm

In preparing to record the view, the amateur is first confronted with the problem of opening the "eye" of the lens—the *iris diaphragm*, which may be seen through the glass of larger lenses, but not of smaller ones—to the proper dimension, so that the film will be correctly *exposed* (affected by light). This is known as setting for correct *exposure*. The subject of exposure, in all of its ramifications, will be dealt with more fully later in this book, but it is well to make some reference, here, to its basic principles, so as to follow the logical sequence of camera handling. The amount of light that reaches the film is governed by the *speed* of the camera as well as by the diaphragm, but we will assume, in this discussion, that the beginning amateur will be prepared only to use the "normal" camera speed, i. e., 16 frames a second. If the light is bright, the diaphragm opening must be made smaller so that too much light will not reach the film and produce *over exposure*. If the light is dull the opening must be increased or the film coating (emulsion) will not be sufficiently affected and *under exposure* will result. Bad over exposure results in a thin, pale image on the screen, while under exposure gives a dark, rather grainy screen result. An index to the diaphragm opening is found in the *stop numbers* by which it is calibrated, the smaller numbers indicating the larger opening. For instance, the diaphragm at $f/3.5$ would be wider open than at $f/8$. "Fast" lenses are those that will give a satisfactory image on the film at the large diaphragm opening of $f/1.9$ or even $f/1.5$. Such lenses must be most carefully made to work at this wide aperture and, therefore, they usually cost more, but they will permit a picture to be taken under circumstances of poor lighting impossible to the slower lens.

In general, the smaller the diaphragm opening, the more sharply defined is the image, but the first necessity in setting the diaphragm is to provide for the film enough light to insure correct exposure. For general work, it is best to try to avoid lighting so poor that an extremely wide diaphragm opening is necessary. Usually the best average results are to be had when stops of $f/4$ to $f/11$ or $f/16$ may be used. Hold the fast lens, with its larger stops, in reserve for emergency use in places where light conditions cannot be controlled. However, in modern fast lenses, the definition is satisfactory even at the widest open stops.

But how is one to determine just what is the ideal diaphragm opening for the view in question? The best method of doing this is by reference to a dependable *exposure meter*. The meter is to be used in conjunction with the the amateur's own common sense, which should be based upon a further reading of the subsequent discussion of Exposure. First, the camera itself is usually provided with an attached exposure chart on which are engraved the diaphragm settings for certain typical, average, lighting conditions. This is a good, handy guide for exposure regulation and it is really a kind of exposure meter. Even so, much is left to the individual and the number of corrections necessary are sometimes confusing to the beginner. A more definite aid takes the form of the "visual" meter, which, in most cases, exists as a tube which is held to the eye and pointed at the object. By reference to an index figure, glowing filament, blue glass or other means within the tube, a reading on the subject may be taken through turning a ring on the outside of the tube, which, in turn, indicates the stop number at which to set the lens. A further development along the line of automatic exposure meters, or light indicators, is found in the photo electric cell type, which will indicate the exposure directly, sometimes by pressing a button, and without looking through a tube. A good exposure meter should be part of the equipment of every amateur, as it will show whether the light

in any locality is sufficient for correct exposure and so will repay its user in saving time and film.

Another factor which, fortunately, tends to absorb the beginner's mistakes in exposure is the fact that, in the processing of reversal film in the laboratory, certain methods are used which largely compensate for errors in exposure, if they are not too far from the norm. As a matter of fact, a surprising amount of deviation from ideal conditions will yet produce acceptable results in amateur movies, and the amateur owes it to himself and to the medium in which he works, not to depart too far from the correct value in exposure.

Focusing

Next in importance is the matter of *focusing*, or adjusting the camera lens with the correct relationship to the film, to give you a clear and not a fuzzy screen image. For those who possess the *universal focus lens*—one whose adjustment in the camera cannot be altered by the filmer—this is not a problem, except that an object should not come closer than five feet (three feet "Eight camera") to such a lens. All fast lenses and many of the better lenses of any speed need to be focused and the amateur should acquaint himself with the principles involved in focusing, as this will make for better pictures. When the image of any given object appears on the film, defined in the sharpest and clearest manner possible, the lens is said to be *critically focused* on the object. To do this critical focusing, the lens *barrel* is turned until its index is set at a foot-age mark which corresponds to the distance of the object from the camera. Theoretically, if the object moves toward or away from the camera while the lens is still set at this mark, it will be out of focus on the film in proportion as it deserts the original location. However, in practice, it is found that a satisfactory picture is possible even when

the object so moves, under certain conditions. In order to insure freedom of movement for his subjects, therefore, the amateur should strive for these conditions.

The distance through which an object may move toward or away from the camera and still remain in satisfactory focus on the film is known as the *depth of focus*. This depth is governed by two factors; first, its limits are reduced as the object comes nearer to the lens and, second, it *increases* as the diaphragm opening *decreases*. A proper combination of these two factors gives us the universal focus lens. This lens is set permanently at a fixed distance from the film and its focus cannot be changed by the camera user. With it, objects are in critical focus at about twenty five feet, but they remain in satisfactory focus to give good pictures; if they move from five feet to *infinity*—an infinite distance away. This lens is satisfactory for those who do not care to “bother about focusing” but the moderately advanced worker will soon desire a lens that he may, himself, focus critically on a given object. This is especially true when *closeups* are needed. (Closeups are views of relatively small objects that show the object filling the major part of the screen, when the picture is projected.) Certain fixed focus lenses may be supplied with closeup attachments, which make it possible to make closeups at certain given distances.

It is a necessity that a fast lens be had in a *focusing mount* (a mechanism by which the distance of the lens from the film may be changed for the purpose of focusing) although this is an advantage in any lens. We have seen that the depth of focus or freedom of movement toward or away from the lens decreases as the diaphragm opening widens, so we must remember that we have a limited depth with which to work when we are using our fast lens with its diaphragm wide open. This is one reason why the fast lens needs to be focused carefully. In estimating focusing distances, more care must be used as the object approaches

the lens. This makes it desirable actually to measure distances at close range. It is possible to secure an optical instrument which will indicate this distance; such a device is known as a *distance meter* and is very convenient at times. However, it will be found that, with a little practice, focusing distances may be estimated closely enough to produce good results.

These, then, are the basic principles upon which the preparation for properly recording the scenes depends. They are essential and should be given every possible attention by the beginner. Above all—

Do not hurry!

Take all of the time that is necessary to make your adjustments properly. Before you press the starting button, go over each single point that has already been discussed. Do not allow yourself to become "flustered"; you may spoil the picture through the neglect of some simple, primary adjustment. The two main adjustments may be remembered by recalling the formula of the "Two D's,"—one for D-istance and one for D-iaphragm.

This business of "exposure"

We know that the sensitive surface of the film is affected by the amount of light that passes through the lens. This amount of light is, of course, the result of the brightness of any object toward which the lens is pointed. The question of how this light finds its way through the lens, into the camera and to the sensitive surface of the film is really not a simple one but involves many factors having to do with the construction of lenses, the *shutter* (a device to shut off the light while the film moves from frame to frame) of the camera, the speed of the film and many other points which will be discussed later.

At the present time, however, we shall concern ourselves only with the *quantity* of light which reaches the film. If this light is too great in quantity, the final image on our film, after processing, will tend to be light and "washed out." This is called over exposure. If, on the other hand, too little light is allowed to reach the film, the final screen image will tend to be dark and lacking in shadow detail. This is called under exposure. To get correct exposure, we must so control the light which reaches the film that the proper chemical reaction will take place thereon to give us a final screen image of the most pleasing and lifelike quality. We know that the side of the film nearest the lens bears a material sensitive to the light, which is called the emulsion. When light is allowed to reach this material, certain chemical changes take place therein; these are later developed and made visible by the processing. The image, before processing, is said to be *latent*, that is, exposed but not rendered visible. In what way, then, can we control or limit the amount of light that affects the emulsion? In two ways can this be accomplished, first, by the time each picture is exposed to the light and, second, by controlling the amount of light passing through the lens to the film. The latter is done by means of an opening which may be varied and which is called the diaphragm.

Two factors control the time during which the film is exposed to the light; these are the speed of the film past the opening and the size of the shutter opening, itself. Normally, the speed of 16 frames a second is used and, with most amateur movie cameras, this gives an exposure duration of about $1/32$ of a second. This varies somewhat with the size of the opening in the shutter. For all calculations, we take 16 frames a second and the exposure of $1/32$ of a second as being average. Means of increasing the exposure time are found in some cameras with a *half speed device*, which, of course, makes the exposure approximately $1/16$

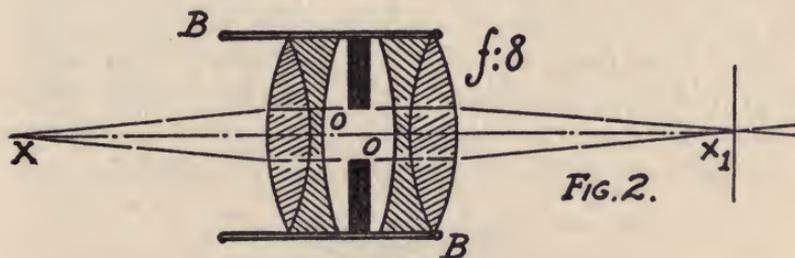
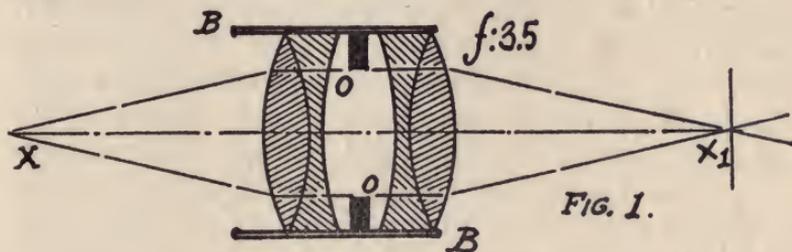
of a second. The reverse is true in *slow motion*, or faster shutter speeds. However, there are more suitable means of regulating the amount of light than varying shutter speeds. The only time that this idea is used to increase exposure is under very difficult lighting conditions where it is necessary to get every possible bit of light. Then the half speed may be used.

The most important method of regulating the amount of light passing to the film is by the use of the diaphragm. This may be compared to a valve used to control a flow of water. It is made of a number of small leaves which are so arranged that turning an indexed ring will cause the opening to close down from the full size of the lens barrel to a very small diameter. (Another and less usual type of diaphragm is provided by a metal plate, containing holes of varying sizes, which may be shifted in front of the lens by moving the plate.) The size of the opening, which is indexed on the ring, is a universal measurement of light, employed in marking all lenses. Thus, any given point on a lens will pass exactly the same amount of light as the same designated point on any other lens. In order to provide what is, perhaps, the simplest explanation of the action of the diaphragm in controlling light, we may liken the inside of a camera to a cubicle, or room through which the daylight passes from a window in one wall. (As a matter of fact, the origin of the word *camera* is derived from a darkened chamber.) If the one window in the chamber is provided with a dark shade and if the shade is pulled down, no light will reach the opposite wall of the room. If we raise the shade partially, so as to admit a small amount of light, we shall find that the wall of the room opposite the window is dimly illuminated. If the shade is raised half way up, this illumination becomes brighter, while, if the shade is completely raised, the maximum illumination will be allowed to fall on the opposite wall. In this, we have a simple explanation of the "valve" action

of the diaphragm. For the window, substitute the lens and, for the opposite wall, substitute the surface of the film.

For the sake of convenience, the range of diaphragm openings is divided into steps; these steps are called stop numbers or, simply, stops. These stops form an index to the amount of light which the lens passes and are, therefore, very important.

A question that sometimes puzzles the amateur is this. "Why does not the diaphragm, when being closed, begin to cut off the edges of the picture, leaving only a small circular area in the center when the opening is at its smallest?" A reference to the diagrams herewith will explain this point fully.



The lens, as used in the movie camera, is an assembly of circular pieces of glass, called *elements*. These are contained in a metal tube, called the barrel, which is shown in the diagram in cross section at *BB*. The diaphragm is indicated inside the barrel by the thick black lines *OO*; this thickness is, of course, exaggerated. *OO* is the variable diaphragm opening. An object placed before the lens is

composed of an indefinite number of points, some bright, some dark. If we compare such an object to a half tone reproduction in a newspaper, we shall the more easily understand how this mosaic of light and dark spots makes up the picture in all its gradation. If we take a single one of these spots in the object before the lens, such as the point X in the diagram, what we show concerning this one point will be true for every other point in the object. The point X reflects rays in all directions, some of which are intercepted by the lens with the diaphragm wide open at OO , figure 1. These rays, passing through the lens, are bent back at a sharper angle, to come together again and, so, they form an image of the point X at $X1$ where it is registered on the film. Now let us turn our attention to figure 2, where some of the rays from the point X are still intercepted, but where the diaphragm opening is made smaller. Since OO is smaller, not so many rays from the point are allowed to pass through the lens. Yet those that do get through are still brought together and are focused as before. Thus, we still get an image of the same point, although not so bright, because fewer rays are allowed to pass through the lens. If we assume this point to be multiplied numberless times, we shall include all the points that make up the picture and, if the same thing occurs with each point, the picture as a whole will be dimmed or brightened as the diaphragm is closed or opened.

Stop numbers

In this way, the actual size of the diaphragm opening controls the amount of light that is allowed to reach the film. The different sizes of these openings are conveniently indicated by means of the stop numbers. *Each smaller stop number gives double the exposure of the preceding one.* A typical set of stop numbers runs as follows: $f/3.5-4.5-5.6-8-11-16$. The main thing to remember is this; as

the stop numbers grow larger, the stop opening becomes smaller, so that the larger numbers allow less light to enter. Thus, if our object is bright, we close the diaphragm to a certain extent by turning the index to a higher stop number. When the light is dull or dim, we turn to a lower stop number, so that the diaphragm will admit all the light that is available. This manipulation of the diaphragm is the single important factor in our control of exposure. A "fast" lens is simply one in which the diaphragm may be opened very wide; the optical qualities of such a lens and the reasons therefor will be discussed later. However, in all lenses, the control of the diaphragm is the foundation of all exposure problems; this control is based upon the light reflecting qualities of the subject and its illumination. Considering this, we shall, therefore, pass next to typical classes of subjects as the simplest means of correlating these to lens diaphragm openings. *From our earlier discussion of film types, we have learned that film emulsions differ in light sensitivity; obviously, a stop number applicable to one type, under given conditions, will not apply to another type under the same conditions. The stop numbers recommended in the rest of this book are appropriate to orthochromatic and panchromatic emulsions (the most widely used) and not to semichromatic or to supersensitive panchromatic emulsions, unless specifically stated. For semichromatic emulsions, the diaphragm should be opened wider, but according to directions received with the film; for supersensitive panchromatic emulsions, the diaphragm should be closed by one stop over the value given in this book.*

Average conditions

This will embrace the class of subjects met under normal conditions of shooting. Such conditions, many times, may be affected by unpredictable factors, but the stop num-

bers here given as related to these conditions will suffice to show the application of the principle. The stops $f/5.6$ to $f/16$ will let in enough light to make a satisfactory picture under almost every average outdoor condition. It will be seen from this that a lens such as the $f/3.5$ has sufficient speed for all ordinary purposes and, therefore, its title, the "all around lens" is well justified.

When making estimates of outdoor exposure, the first advice given is usually to observe the intensity of the primary light source, which is the sun. For all ordinary purposes, three main conditions may be considered, namely, "brilliant or bright," "cloudy bright" and "cloudy dull." Conditions may vary under any one of these headings, of course, but they are handy for quick estimates. A glance at the sky will be sufficient to determine which one of these three conditions prevails. Bright sun speaks for itself. "Cloudy bright" indicates a condition where the sun is still faintly visible through a thin veil of clouds, while "cloudy dull" means a daytime sky completely overcast.

It is next possible to classify available subjects into certain broad categories. The most brilliant are those which are brightly illuminated and which reflect the most light into the camera. Under these conditions, we should at once prepare to use the small diaphragm opening. The greatest possible amount of light comes from the brightly lit sky so that, in general, it is best not to include too much sky in a picture where other objects are important. Small diaphragm stops should be used with sea, sky, beach or snow scenes under brilliant sun, as these reflect the most light. The lens should be stopped down to $f/16$ under all such conditions. If we decide that the weather is "bright cloudy," the stop of $f/11$ is indicated. $F/8$ is used under an overcast sky.

Distant views

Under this heading are included all objects which are only slightly less bright than those described in the pre-

vious paragraphs, such as distant views, landscapes, mountains and, in fact, any open view not containing large areas of shadow. We apply the term "distant" in movie work to all objects more than fifty feet away and most of us have noticed, in such views, that the shadows seem to shrink together and the light to become predominant. If our distant view includes a lot of sky, we should remember the caution of the preceding paragraph. Under such conditions, when the sun is bright, the diaphragm may be set at any point between and including $f/16$ and $f/11$; for the same subject, under bright cloudy skies, $f/11$ to $f/8$, if the light is poor, $f/5.6$.

Average distances

Subjects under this heading may be classed as those which occur in the middle distance and which are partially in light and partially in shade. This usually includes houses, groups of persons, foregrounds of landscapes and the like. Under bright lights, such subjects can successfully be photographed at $f/8$, under bright cloudy conditions at $f/5.6$ and under dull skies at $f/4.5$.

Closeups

Shots of this nature would include portraits of persons taken in the open, where only head and shoulders are included, or more distant subjects which contain more shadow areas than light. Such shots call for an average stop of $f/5.6$ on a bright day, $f/4.5$ under bright cloudy conditions and, for dull, $f/3.5$.

Difficult lighting conditions

Under these environments are included those conditions at which the subject reflects very little light, both because of the restricted light falling upon it and also because it may be dark, itself. Such subjects are usually

found under heavy shade, as of dense foliage, under dark porches or under most conditions where the top light from the sky is cut off. Subjects of this nature demand exposures of $f/4.5$ to $f/3.5$, depending on their light reflecting power. Stops wider than $f/3.5$ or $f/2.7$ are usually considered entirely within the province of the "fast" lenses and such unfavorable lighting conditions are almost always in themselves unusual and defy definite classification. Of such are shots made late in the day, of interiors, in rain or fog, in dark streets and similar places.

So far, we have dealt with a number of more or less representative conditions. Having derived what estimates we can from these conditions, let us inquire briefly into some of the underlying, basic principles which govern exposure itself, which means, actually, the amount of light that emanates from the subject. As we have said before, this is almost completely a matter of *reflection*. If the subject is of a light nature, it will reflect into the camera more of the light that it receives; therefore, the diaphragm should be closed more than the average. Conversely, if the subject does not reflect, but absorbs the light it receives—if it is of a dark nature—the diaphragm should be opened over the average to compensate. Don't confuse bright *light* with a bright *color*. Red seems bright to the eye, but to the film this color is a certain shade of gray and will so be recorded. White is brighter than any single color under the same illumination. Sometimes the same scene will contain very brilliant and very dark objects. Such scenes are to be avoided because the limit of flexibility of the emulsion in recording these widely varying light conditions may be overreached. In such a case, set the exposure for the most important part of the scene and let the rest come out as it will. But, if at all possible, try to avoid these extremely wide variations, such as a brilliant patch of sunlight, surrounded by a very dark area of foliage. This principle gives a hint as to the proper use

of the exposure meter. Approach closely enough to the important object in the scene, so that the meter will be affected by that object only, not by the whole scene. In this way you will, at least, be sure of what you wish to record. Luckily, more distant views, in which no object is particularly important, are more even in tone. A factor that always affects the diaphragm setting occurs when especially close objects are being photographed. Under such conditions, it will be found that the lens does not work at its rated speed and the diaphragm should be opened approximately one stop over or, on very close objects, a little more, to compensate for this. This principle applies with any object closer to the 16mm. camera than three feet or thereabouts.

Simple filter work

The use of a *filter* always provides interesting effects and even the beginning amateur can use these aids to naturalness on the screen with ease and certainty. The usual type of filter is of a yellow or amber color and its purpose is to hold back a certain amount of blue light which is reflected from the scene. It so happens that the color, blue, is very strong actinically; that is, it affects the film much more drastically than do other colors or light wave lengths. For this reason, in a picture containing blue sky or water, or blue distance haze, this color "burns into" and produces an over exposure in the picture before the other colors are properly recorded. The function of the filter is to hold back some of this blue and, so, to make the action of all of the colors more even. The filters ordinarily used are the 2X and the 4X. The former gives an average color *correction*, or evening up, while the latter gives a slightly exaggerated one. The 2X filter may be used profitably with panchromatic film on all shots taken in sunlight except closeups, while the 4X is best for distant

and very bright views only. The widest use of the filter is in "bringing out" the clouds in the sky; this it does by holding some of the blue of the sky back, so that the whiteness of the clouds will appear against a darker background. Not all of the function of the filter lies in this, although this is one of its best known effects. Naturally, the more deeply colored a filter, the more apparent its effects; in a later chapter will be discussed some of the specialized filters for specific purposes. The filter affects exposure in that it holds back some of the light; hence, the diaphragm must be opened to a certain extent in order to give the same exposure to the film that would be given under the existing conditions without a filter. An index of the amount of increase in the diaphragm opening with a given filter is found in the *filter factor*. This factor varies with the film used, so that it should be ascertained both for ordinary and supersensitive film, when buying the filter. The Amateur Cinema League's Technical Department has available to members a handy filter chart, which gives at a glance any revised diaphragm setting when using a filter of given factor.

Making the film mean something

After the beginning amateur movie maker has acquired the simple mechanics of handling his camera and an idea of what light does to film, the next thing he will want to consider is the control of the subjects of movies. It may seem rather peculiar, at first glance, that there should be a way to deal with subject matter as well as a way to handle the camera, both to be learned at the very beginning. Those who have used still cameras will recall no directions about subject matter until the rather advanced question of "composition" came up. But movies, whether amateur or professional, silent or sound, have one quality that sets them apart from still photography. Perhaps this quality may best be made clear by the obvious statement

that movie photographs are not projected—that is, flashed on a screen—piecemeal. For convenience in showing, if for no other reason, they are spliced together. One *scene* follows another without any break and the attention is held continuously. This makes it possible to tell a continuous story in an amateur movie film, a possibility upon which early experimenters, like Muybridge, LeRoy and Edison, fastened and as a result of which the professional photoplay was developed. The word “scene” will frequently be used and it may be well to give the usually accepted definition so far as movies are concerned. A scene is the total of uninterrupted footage shown on the screen taken with the camera in one position. When the camera changes position, a new scene comes into being. It is sometimes used loosely to mean the background for action also.

Not only do movies offer the opportunity of telling a story, but the fact of the continuous projection of scenes, one after another, implies that some sort of story will be told or, in other words, that there will be some kind of relationship between these scenes. If there is none, the screen effect is chaotic and mixed. For example, if one were to see on the screen first a scene of the youngster of the family sitting on the front steps, then a *shot* of traffic on Main Street (the term “shot” used in this connection means the same as “scene”) followed by one of the golf club, ending with a scene of the youngster digging in the garden, it is evident that the lack of logical order of these scenes would be displeasing. The audience would be fatigued by attempting to follow the picture, as one subject quickly shifted to an entirely different one. The very undesirable effect of a hodge podge of movie material is quickly recognizable to anyone who has seen this kind of thing on his friends’ screens. Fortunately, one is not often tempted to take such dissimilar scenes in succession but, even if the shots were somewhat more similar in subject, the result would be almost as chaotic. Film econo-

mizers almost invariably present these bewildering shifts from one thing to another in an effort to get as much as possible into one film length.

It is clear, then, that some sort of order or plan is indispensable in a good amateur movie. The plan may be so simple as hardly to merit being called a plan at all, but its existence in the mind of the filmer is of paramount importance if he is to get anything like his money's worth from equipment and film. Fortunately, movies offer two chances to work out some kind of order in films. One may adopt a simple idea before filming and take the scenes accordingly or one may take "pot shots," as the spirit moves, and later cut the film into scenes and resplice it, putting the scenes in a different order. This is called *editing* and it gives the movie maker a second chance to arrange the subject matter of his picture. (How to make the splices and to edit films will be discussed later.)

One can readily see that the best and the simplest way to secure order and coherence in films would be to combine both ways, that is, to plan the subject matter in advance as far as is convenient and later to rearrange, in editing, those scenes that are not in proper places. Naturally, planning is the first step, for one can make a rough plan even in advance of shooting the film.

At this point, some reader who has recently bought his amateur movie camera may have the feeling that all of this is a discussion preliminary to advice on working out a professional play, that he is not going in for that kind of thing, that movies will be an entertainment and a very casual hobby with him and that, consequently, this does not concern him. In this, he will be entirely wrong, for one must remember that the purpose of this discussion is to help us to avoid the unsatisfactory and chaotic effect on the screen caused by the projection of entirely unrelated scenes. It does not require a professional *scenario* (outline for a motion picture, by scenes) to prevent this.

A fundamental understanding of cause and effect will obviate it perfectly.

The first step is obvious. If one can make a particular reel of a given subject, one automatically eliminates most of the confusion. Thus, if there is a fifty foot reel (at the present time, there is no "Eight film" equivalent of the fifty foot 16mm. reel) of Sonny playing in the backyard, at least the audience does not have to make a mental jump from Sonny to golf club and from there to Main Street. The film is all about Sonny and, as such, it is a unified picture which one can see restfully on the screen. It may be that the fifty feet (twenty five feet of "Eight film") of Sonny will not even be on a separate reel and that they may be a part of a hundred foot (fifty foot "Eight film") reel. However, we see Sonny all in one place and, when that part of the film has run through the projector, we come to something different. The same point is true of the golf club; thirty or fifty feet (fifteen or twenty five feet of "Eight film") will be interesting all together, but, if the scenes are separated by shots of a picnic, then we have confusion. The same thing is true of almost any other subject that one could name. Obviously, it is the same point that applies to writing. One would not write a sentence about one subject and then a sentence about an entirely different one. One deals with a given subject as far as desired and then drops it and takes up another. This is an automatic commonplace habit to any adult and the chief reason that it is not a commonplace habit in movie making is that, since filming is relatively new, our own critical faculty about movies has not reached the point where it operates automatically to prevent film idiocy. Another reason may be that we are all accustomed to look at groups of snapshots in which there is rarely any reason for particular order, since snapshots are each looked at separately.

Although getting all scenes of the same subject to-

gether in a particular reel or in one place in a given reel is not, by any means, the whole story in making first class entertainment pictures, the habit of thinking in these terms as one films is certainly of great importance. It makes one's movies much more palatable to any audience and it is the first step in creating genuinely entertaining pictures that give lasting satisfaction to the amateur who made them.

At this stage it is a good idea to consider a fact that a beginning amateur movie maker often fails to realize. After all, one makes amateur movies to screen and one wants them to entertain and interest an audience of some sort. The audience may be a group of intimate friends or a large group of casual acquaintances, or it may be just two or three members of the family. No matter what this audience is, it is an *audience*. Nobody wants to make movies to be stored away in an attic unseen. On the other hand, as one progresses in movie making, there is no keener delight than generous appreciation and real enjoyment by the audience. This alone justifies the whole consideration of arrangement of subject matter, advance planning and editing. Snap shooting with a movie camera is an easy habit into which one can fall, but it can never yield the satisfaction of planning.

Sequences

Although gathering similar subject matter together in one place in a reel or on separate reels is easily the first step in preventing a jumbled chaos on the screen, it shares equally in importance with another device, that of building up a logical series of scenes about a given subject. When, on the screen, the scene shifts from Sonny on the front steps to Main Street and then the golf club, as in the horrible example already cited, not only is the effect unsatisfactory because of the sudden jump from one type

of thing to another, but also because one does not see enough of Sonny or Main Street or the golf club. The single scene gives a fleeting impression and Pop!—we are off on something else. Sonny may be doing something interesting and we want to see more of it. At the golf club, someone may be about to drive and we are naturally unsatisfied at the lack of completion of the action. This might be avoided, perhaps, by running the camera longer and thereby making the scene longer, but it will be found that this merely draws the movie out to a tiresome length. What is needed is another scene of the same subject from a different viewpoint. Suppose, in the case of Sonny's movie, after making the shot of him standing on the step, we then stop the camera and walk closer to him to make a nearer view of his face commonly called a *closeup*. The audience would first see Sonny standing on the porch and would get a general idea of the picture, then it would see a close view of his face, showing his expression as he looks at some toy that he carries. Certainly, the audience would get a much better picture of the youngster and a more interesting one, as well. A complete stranger would now know what Sonny looks like and could take a personal interest in him. The two scenes follow one another naturally on the screen and there is no break in the transition from one to another. Next, suppose that we step back again to one side and get a shot of Sonny as he walks down the steps past the camera, trailing his cart or holding his toy. Somehow that completes the film paragraph. We see Sonny, we get a close view of his face and then we see him from another viewpoint as he walks out of the picture, evidently bound for somewhere, perhaps the walk in front of the house or the sand pile.

This is a typical *sequence* and just three such scenes on the screen can produce an effect that would delight any father or mother. Sonny has his moment on the screen uninterrupted. He is not forced, by the *pot pourri* method,

to compete with a scene of the fire engine or the golf "pro" demonstrating a tricky shot.

Sequencing applies equally well to a movie of any subject. There is no rule of thumb for the exact number of shots nor for the exact viewpoints of the camera; these logically suggest themselves. The example given is typical, however. The cameraman first took a shot that showed all of the youngster as well as enough of his background to show where he was and what he was doing in a general way. Then he made a much nearer view to present the audience with a portrait of the boy. Finally he ended the subject in a natural way by letting him walk out of the scene on some device of his own. There might have been a fourth shot of the sand pile with Sonny walking into the camera's view and starting to play in the sand. In turning the shot of Main Street into a sequence, the amateur cameraman might have followed the scene of the busy street corner with a nearer view of the traffic officer directing the streams of cars. He might have ended the sequence by going a distance down the street and taking a longer view of the whole thing. The golfer might be shown in a near view "teeing up" and then from another and more advantageous position as he drives; finally he might be seen walking toward the camera as he starts for his ball.

It can generally be said of a sequence that it is a good idea to start first with a general view that establishes the background and starts the "story" and to follow with a nearer view (*closeup*) that gives some interesting detail or emphasizes some portion of the scene, ending with another general view that supplies a kind of period to the train of thought.

The sequence is a unit with which to build up a smoothly flowing picture. It obviously fits with the earlier suggestion of avoiding jumbles of scenes by putting shots of similar subjects together. The fifty foot reel of Sonny

would consist of a series of these sequences. The scenes of him on the steps might be followed by another series at the sandpile, while he builds a sand castle. Here, four or five scenes might be used. Perhaps the next theme might be Sonny going for an automobile ride or riding on his cart in front of the house. Of course, one would not always follow the same order of camera viewpoints, for the completed reel would be monotonous. Some of the activities would include more scenes than others. Some would not require the very near views while others might include Sonny's father and mother as well as Sonny.

A little story

The amateur's intelligent use of sequences will go far toward making his movies pleasing to an audience. He is not trying to fight the fact that one scene immediately following another on the screen implies a relationship between them. He has taken advantage of the fact to give his films a smooth flowing and, therefore, an agreeable development. He can go further, for he can tie the sequences together into a little story. The use of the word "story" is likely to be misleading, because, in associating it with motion pictures, one's mind immediately leaps to photoplays and similar films. The word is used, frankly, for the lack of a better term. It means, in this instance, the logical development of a theme or thread of interest to make movies more unified and complete—more entertaining.

Our "story" may be nothing more complicated than *Junior at the Beach*. It might start with a sequence of Junior getting into the car with his parents. Then there would be a sequence of the party arriving or emerging from the bath house with Junior in a swimming suit ready for the fray. Here, very near views would be useful to show Junior's delight at the prospect. (No one will need

to tell him to "act"! Next would come a series of scenes of his father leading him into the water, perhaps teaching him to swim. Another possible subject would be building a sand castle and its subsequent destruction by the waves. Finally might come a sequence of the picnic supper or of Junior reaching home.

Such a film carries along with it a thread of interest or theme upon which the scenes are strung. It has a logical development and comes to a definite end. It incidentally presents a perfect real life portrait of Junior spending a very happy day. It will interest even total strangers for, like all stories, it holds the promise of "something happening." In seeing it start on the screen, interest is carried along by the natural sequence of events and there is always the stimulus of curiosity as to what will happen next. It has a very much stronger appeal than a series of unrelated scenes. Any amateur movie maker may easily make the test some evening by getting the reactions from his audience on a film of this type as compared to the hodge podge. In making such a test, one must be fair, remembering that Junior at the beach is a fairly average subject and one that cannot be expected to compare in entertainment value with random shots of a water front fire or some other amateur "scoop."

It is very easy to work out simple stories for films. A film story of Junior and the first snowfall would be handled in much the same way as the one of the beach. A picnic, a fishing jaunt, a walk, a motor trip, a visit to Europe and thousands of others, featuring either Junior or some other member of the family and, even, the whole family itself, are all susceptible to the same type of handling in film. A natural chain of events is selected as the theme and following it by sequences does the rest.

Advance planning

Of course, the treatment of themes or threads of interest depends a great deal upon the imagination of the individual movie maker. This treatment can be very simple or fairly complicated and it may be whatever individual taste and an eye for movie scenes dictate. Among films of this type is found some of the very best amateur work. The important quality shared by all of them is that they do not happen by accident. They are planned. Usually this plan is formed in the mind of the filmer before he begins. He may work it up as he goes along but, if he tackles the filming with an advance concept of what he wants to get, getting it will be that much more simple and the finished picture will be that much better. Advance planning of some kind is almost always a concomitant of good movie making. Think the whole film out in advance of starting it and think out each sequence before pressing the button. The little mental effort that distinguishes this method, as against simply starting the camera and letting it click, is more than worth the trouble. It is the genesis of real pleasure in movie making. Think before you shoot, remembering that full happiness in movie making comes with seeing sequences on the screen that bring expressions of pleasure from the audience.

Simple tricks

There are a number of very simple *camera tricks* that can be used to enliven amateur films. They can be worked into little stories or used in individual sequences as desired but they are all much more effective if they are fitted into some sort of theme. One set of tricks is based upon the

very simple expedient of stopping the camera, altering something in the scene and starting the camera again. Since not a second elapses between the sections of the scene as it is screened, it does not look as if the camera had been stopped at all. Whatever change has been made in the scene appears to have been done by magic. Simple plots to use this device can easily be evolved. For example, a sister is told that whatever she wishes she may have. She is playing with a toy kitten and wishes that it were alive; presto! the kitten in her arms *is* alive. While the child is seated very still with the stuffed toy in her lap, the camera is stopped, a real kitten substituted for the toy and the camera started again. A number of amusing stories of this kind can be worked out. Junior is reading a fairy tale and wishes that a wizard would appear. His wish is promptly gratified by the appearance of a man who waves his wand to dissolve Junior into nothingness. He relents and summons Junior again, who materializes from the rain barrel. Slightly more elaborate stunts may be handled in the same way. Junior wants to pass through a pane of glass. He jumps and, miraculously, he is on the other side. This is done by filming him starting to jump, stopping the camera and waiting for him to walk to the other side of the pane where, after the camera is started again, he is found crouching as if he had just landed; then he straightens up. Another youngster who comes in contact with the wizard is able to perform equally startling effects. A sudden leap carries him to the top of a high fence or wall. The possibilities to an imaginative filmer are endless.

Another set of tricks is based upon an almost equally simple principle. If the camera is held upside down while it is operated and if, after the strip of film is returned from the processing station, it is inserted right side up in the reel, all action within the strip will be reversed. It is this fact that makes possible the diver's miraculous leap back

to the platform, that occurs so often in professional news-reels. By holding the camera upside down, a smoker may appear to inhale smoke from the empty air, objects will leap at command and all kinds of illusions may be created. For instance, a member of the family may be seated on the porch and reach for a magazine; the magazine leaps to his hand in response to his wish. It is done simply by filming the subject reaching for the magazine, stopping the camera and giving him the object, then starting the camera again, this time holding it upside down, while the subject tosses the magazine back to the table. Reversed, the scene will present the periodical rising to meet the outstretched hand.

In the same way, water may be made to flow uphill or back from a glass into the pitcher. A bicycle can be made to rise from where it has fallen on its side and return to its owner like an obedient colt. Combinations of these two methods offer endless opportunities for all kinds of short film stories of magic and marvels. Needless to say, they are particularly popular with children who will never tire of a clever fifty foot film of themselves mastering the elements in this peculiar fashion. Excellent reels have been made with no other camera tricks than these two. Whole little fairy tales have been produced in this way and, on the other hand, tricks have often been used merely to liven up a sequence or two of children.

Footage

Sometimes the exact length for a given scene—the *footage*—causes some perplexity. There is no exact rule governing the proper length of scenes but there are a few general guides. While two feet (one foot "Eight film") is enough for certain short scenes, it is little more than a flash on the screen and is certainly insufficient for a pleasant view of cattle in a peaceful meadow, for example.

Six feet (three feet "Eight film") is not too long for a slow *panorama* (a scene taken with the camera pivoted slowly from left to right) nor for a typical sunset shot at the end of a reel, but it is too long for the average scene. Four feet (two feet "Eight film") is about the correct average scene length for usual amateur movie subjects. There would be many exceptions in amateur photoplays and even, in some cases, in travel films. Judging the length suitable for given shots is best developed by experience. At first it is troublesome but it will be found that, after several reels are made, a workable feeling has been developed for the right scene length; after a year or two of experience, this reaction will become almost second nature.

Early faults

Very early in amateur movie making it pays to become conscious of things which may make the difference between good and bad films. It is important that the camera be held steady—that it shall not move backwards or forwards or waver in the operator's hands. Scenes should be clean cut and neat, an effect produced by holding the camera steady, without movement, while footage is being exposed. One must early acquire the capacity to count footage (two and one half seconds for each foot) without trying to check up on the counting by a quick glance at the *footage meter*, while the camera is running, as this almost always results in camera wobbling and a wavy scene. There is frequently the temptation to move the camera suddenly to follow action as one would with the eyes. This temptation is second nature to a beginning amateur and it must be eradicated in order to get good screen results, for it produces a quick, unpleasant, jerky effect on the audience. Sometimes it is desirable to swing the camera on a pivot to follow some essential action or to present a panorama of scenery. However, a movie maker will do well

to pause before making any camera movement, to decide whether or not it is essential. More often than not, the action or view may be presented better by stopping the camera and selecting a new viewpoint. The panorama has certain definite uses that will be discussed later, but it is almost axiomatic that the less the camera is moved while it is running, the better will be the picture on the screen. It may seem rather dictatorial to make such a hard and fast statement but, when one realizes that the most common fault detracting from the beauty of a beginner's movies is a wobbly and uncertain screen image, it will be seen that this warning is justified.

Another fault is making too few closeups. Proper planning of sequences would assure plenty of them and that is one of the reasons why it is so important to plan the sequence units of a picture. Although it would be entirely possible to get too many closeups in a film and, consequently, too few images of the larger views, this is a fault that is practically never encountered, while on the contrary, there are too few closeups in over half of the amateur films made. The closeup is very useful in emphasizing a detail, presenting a recognizable portrait of the subject of a picture and in giving dramatic importance to a point. Whenever he is making a sequence, however short or unimportant, the new movie amateur would do very well to study the opportunity for closeups, even going out of his way to take them in addition to the longer shots.

Another bad feature of many amateur films is the self-consciousness of those who are filmed. The cameraman can hardly be held accountable for this very human failing, but he can help to prevent it by giving his subjects something to do. Obviously, since we are dealing with a movie, it will be bad for him to group them as if they were being posed for a snapshot. A suggestion of some kind of natural action should be given—the less like "acting," the better. The best portrait sequences can be obtained by catching the

subject at some daily task or recreation. Good film studies may be made of a young man playing tennis, a friend on the golf course, the head of the family bringing the car out of the garage or of the older boy swimming or diving. All of the examples cited, it will be seen, are activities that require the whole attention of the participant. Since this is the case, he cannot be conscious of the camera and, as a result, a really natural and unaffected film portrait can be secured. When there is no opportunity to film the subject engaged in some familiar activity, as is sometimes the case when the camera is brought out on the spur of the moment, it is, at least, always possible to tell those in the scene not to look directly into the camera's lens. It is easier for them to remain unself-conscious if they look naturally at something else. If someone outside of the picture creates a diversion to attract attention, so much the better. It is, after all, like the old portrait photographer's well known, "Now, look at the Birdie!" It will be seen that advance planning gives an opportunity to eliminate this troublesome factor of self-consciousness just as it helps in so many other ways. By working out the picture in his mind in advance of filming it, the amateur cameraman can think out opportunities to have those he wishes to film engaged in some casual activity. The short, simple *film stories* discussed earlier usually provide these opportunities by supplying natural action and do not leave the filmer helpless with a stilted group of people furtively watching what he is doing at the camera.

The beginning cameraman who has mastered the simple art of building up sequences, who has attended to the simple technique of operation, who has given some thought to basic camera principles, who insists upon a thread of interest or theme in his films, who holds his camera steady and who provides natural action for the subjects of portrait scenes has gone far in the art of making movies, further, perhaps, than a good many amateurs who have owned their cameras for several years.

CHAPTER II

SHOWING THE RESULTS

Handling the projector The projector is the medium through which the finished film is exhibited to an audience. No matter how careful and well planned the work that goes into the outline of the film and its actual photographing, unless the all important matter of projection is considered, the screen results will be problematical. Just as an art gallery presents to the public a work of art properly framed and hung, offered in a pleasant environment under a good light, so should a film, which is carefully planned and photographed, be presented to the audience through a screen image produced by means of a good projector and under favorable circumstances. Moreover, since the attention of the audience should not be distracted from the picture on the screen, the projectionist should make sure that his machine is in proper operating condition, beforehand, and should familiarize himself thoroughly with the operation of the particular machine that he is using.

Every important point about the operation and care of a new projector will be found in the manufacturer's instruction book which comes with the machine. It seems to be too often the rule, on the part of many amateurs, not to take the trouble to read these instructions or just to glance through them superficially, but this practice does not make for the best projection results. Read every word of the instruction book! The projector is a fine piece of mechanism

and, if it is to last and give its user his money's worth, it certainly justifies this fair treatment.

The new projector should carefully be unpacked and its list of accessories checked with the printed list supplied by the manufacturer. Thereafter, the owner should proceed to familiarize himself thoroughly with its operation as described in the book of instructions. This should be done privately, so that he may take plenty of time in the operation. Three very essential points to remember in keeping the operation of the projector up to the very highest standard are, first, *clean film*, second, *clean gate* and, third, *clean lens*. The matter of keeping film clean and in good condition will be discussed after we have finished with the projector. The gate of the projector is, of course, that part of its mechanism which corresponds to the camera gate, as shown in the diagram in the previous chapter; it is a "runway" for the film, to hold it flat and plane in front of the projector aperture, the film window through which the light shines. The gate of the projector should be kept scrupulously clean. Particles of dust and emulsion have a tendency to collect at the gate, because, here, the film is under a certain pressure. If these are allowed to remain they will harden under the heat of the lamp and will have a tendency to scratch and mar subsequent film passing through. A gate cleaning brush is provided with the new projector and should be used according to directions. If emulsion does collect in the gate, it should be removed with a toothpick or wooden or ivory instrument, never with one of metal. For, if the smooth, polished surface of the gate is scratched, the tendency to "pick up" further accumulations of dirt and emulsion will be aggravated. The essential parts of the projector are the *feed and takeup reel arms*, which usually fold out of the way for packing the projector in its case; the *mechanism housing*, which encloses the mechanism that actuates the *feed and takeup sprockets*; the *motor*; the *claw, single or double*, which gives the film its step by step motion; the

shutter, which cuts off the light while the picture change is taking place; the *lamphouse*, which contains the *lamp* and *socket*, together with means for ventilation; the *optical system*, which includes the *reflector*, the *lamp filament*, the *picture aperture*, the *condensers* and the *projection lens*, all centered on one axis, and the *film gate*. The operating principles of the projector mechanism are so much like those of the camera that the reader is referred to the diagram in the previous chapter, if he cares to refresh his memory on these things. In addition, the projector usually is supported on a broad, firm *base*, which contains the *light* and *motor speed controls* as well as the *forward* and *reverse* control, if any. Some kind of *tilting device* is usually incorporated, so that the picture may be centered on the screen. Some projectors have a *still picture attachment*, which enables the machine to be stopped so that a single frame will be visible on the screen. It should not be used for too long a time in projectors with high powered lamps.

The quality of the screen image is greatly affected by the condition of the projection lens, which magnifies the small film frame to the very large screen proportions. Because of this tremendous magnification, every speck of dirt and dust and every careless fingerprint will show up plainly on the screen, detracting from the quality of the image. A soft, lintless cloth or, better still, a piece of lens cleaning tissue, with just a suspicion of moisture, should be used to keep the glass of the lens free from all marks and dirt. A gentle rubbing will serve the purpose; the glass should never be allowed to become so dirty that it needs "scrubbing." Not only the front element, or part of the lens toward the screen, should be cleaned, but the entire *objective* should be removed from its mount and cleaned, back and front. (The word "objective" is merely another word for "lens.") Sometimes an excess of oil is thrown on the rear lens element by the pulldown claw. This should carefully be watched for, as a film of oil on the rear element will destroy the screen defini-

tion. Of course, a general cleaning of the outside parts of the projector should be given when needed. It is good practice, always, to return the projector to its case, after it has cooled, when a projection session is ended, as this will keep most of the atmospheric dust out of the fine mechanism. Wipe away any oil which may have dropped on the housing or which may have seeped out from the moving parts. Dust should be cleaned away particularly from the motor housing, so that it will not get into the motor and cause wear on the brushes. Incidentally, do not attempt to take the motor apart to clean it. This will seldom be needed and had better be left to the service man. In most projectors, the reflector, behind the lamp, and the condensing lenses may be got at and kept clean with a soft cloth. Sometimes the heat and atmosphere will cause a slight cloudiness which comes off with a light rubbing.

In setting the projector up for operation, see that the electrical connections to the lighting circuit are properly made. An important detail, which should be checked each time that the projector is ready for use, is to see that the *lamp rheostat* is turned down to its lowest point, if the projector is one which uses a high powered lamp with controllable brilliance. If this is left turned up to its full capacity when starting, the lamp may blow out, a result produced by the sudden rush of current while the parts are cold. Be sure that the controls are set for running forward and that the speed of the machine is not turned up too high, when starting. In placing the reels on the *spindles*, be sure that they are seated properly, so that they will not fall off while the machine is running. Make sure that the film is wound on the reels in the proper manner for projection. A simple way to determine this is to hold the film in the hand in its projecting position and look through it toward the screen. The titles should be readable, but *upside down*.

In threading the film, care should be taken to see that the *sprocket teeth* are properly engaged with the film per-

forations. See that the proper sized *loops* are made, according to the directions given with the machine, and that they are not so large as to rub on some part of the projector housing and to scratch the film. The film should be properly seated in the gate and it is preferable that the pulldown claw should be engaged with the perforations, before starting.

Any mechanical device needs lubrication so that it will operate smoothly. The use of the oil supplied by the manufacturer is most advisable. One should be careful not to use too much oil in lubrication. If this is done, surplus oil will leak out and spread over those parts that do not need oil; this will catch dust easily and the projector will soon look untidy. A drop or two in the designated places is enough; here, again, the directions of the maker should be followed. A well oiled machine runs smoothly and quietly and adds much to a pleasing presentation of the film. Unnecessary noise in the projector may be eliminated by placing it on a firm, solid stand. Avoid any kind of light, hollow support which may give a sounding box effect. A table or stand with a fairly heavy top is desirable, and noise may be further lessened by placing the machine on a rubber pad or on one of felt or cork, substances which will absorb much of the noise and vibration.

Various arrangements of the screen and projector will be subject to local conditions. If possible, the best screen presentation will result by placing the projector in a separate room. If there are connecting double doors, they may be partially closed, so that there is just enough room left for the beam of light to pass through. This lessens the distracting effect caused by threading the projector in the midst of the audience.

All kinds of refinements are possible to provide a finished effect in projection. Amateurs who are particular in this respect have arranged special rooms for the purpose of projection, with comfortable, wicker or theater type chairs, arranged at the proper positions for a most favorable view

of the screen. The screen may be a permanent installation, protected by a curtain or arras, which is drawn aside when the projection is about to begin. Phonograph music, amplified either electrically or acoustically, may be carefully chosen to match the mood of the picture and played at the same time; special lighting of the projection chamber may be arranged to enhance the effect, just as it is done in theaters. Such refinements, of course, add to the pleasure of the film and increase the respect of the audience for your pictures.

Screens

The matter of screens may be discussed here. There are many different kinds available, those which collapse in a cabinet, those that pull from a roller, those which stand on a table or are hung from a tripod and the metallic, noncollapsible type. The kind of screen purchased must be suited to the user's own requirements, both financial and for convenience. Two surfaces are popular in commercial screens, the matte, silver surface and the glass bead surface. The quality of the picture on each of these surfaces had better be left to the amateur's choice, rather than recommended. The silver surface, in general, gives a more "contrasty," cold tone, while the glass bead surface gives a warmer tone. Both are very efficient. Certain noncollapsible screens are available, having an etched, metallic surface; these are excellent for a permanent installation.

Film care

Since the condition of the film, itself, has much to do with perfect projection, it is appropriate here to discuss this subject. To keep film in the best possible condition, it should be carefully replaced in its *humidor can* immediately after projection and rewinding. A certain amount of moisture is necessary to keep the film pliable and this moisture will

gradually evaporate if the film is left for a long time exposed to the air. For this reason, it should be kept tight in its can, when not in use. Humidor cans are available in several varieties, as well as larger cabinets and containers designed for the same purpose. These containers make use of some form of absorbent material which will retain moisture, and this humidifying pad should be *dampened*, not *wet*, with water about once in every thirty days, if the film is used often. This is all that is really necessary to keep a film in good condition as to pliability. Special humidifying solutions which are sold accomplish the same purpose in moistening the humidifying pads and do not evaporate as readily as water. The film in its various handlings is likely to pick up a certain amount of dust and dirt. Minute particles of grease from the hands, small bits of emulsion and ordinary dust from the air, all combine to make noticeable spots on the screen, when magnified by projection. After the film is finally spliced and *titled* (provided with captions) it may effectively be cleaned by means of passing it through a cloth moistened with alcohol, carbon tetrachloride solution, "Carbona" or with one of the film cleaning fluids now on the market. Grease, dirt or other superficial marks may be removed to a great extent by running the film through a piece of soft, lintless cloth, held loosely in the hand and saturated with the cleaning fluid. As fast as one portion of the cloth becomes soiled, it may be folded over and a clean area substituted. Care should be taken to use some cloth as cotton plush, or the like, which will not shed lint, as this may catch in the perforations and show on the screen. Several commercial processes are available for cleaning and conditioning film and these are worth while, if the film is of unique nature.

Editing aids

An indispensable aid to editing is found in the *rewind*. Without this device the amateur is so handicapped that the

work becomes a task and not a pleasure. The best type of rewind is one which has two spindles geared to cranks, one at each end of a board heavy enough to form a solid base. Some of these are made with a crank at one end only, the film running on a free spindle at the other end. This type is not so convenient as the "double live spindle" type. Of course, the film must travel in a free, straight line between the reels and be wound easily in either direction. The spindles should be high enough to hold four hundred foot reels. Some of these devices are provided with brakes, so that the speed of the reels may be checked when winding at high speed. Unless some such means of braking is provided, trouble sometimes results when one reel is nearly full, the other is turning at a high rate of speed and it is desired to stop the film. Unless care is taken in stopping both reels at once, the nearly empty reel will continue turning and run much of the film on the table or floor. When taking up un-reeled film, care must be taken to see that it does not kink.

Another very handy aid is the magnifier or *viewer*. Such a viewer should be illuminated and should present the magnified picture of a size that will permit easy inspection of any frame. The horizontal type, which enables one to work at the table comfortably, is well known. In this, the image is seen right side up, although the film passes horizontally. The ultimate in what the amateur may obtain is a device in which the film is shown in motion. In this type, the film runs vertically and may be seen through an opening when sitting in a comfortable position. A *splicer* is an integral part of this unit.

Splices

The operation of splicing is a simple one; in fact, the simpler the movements to which it is reduced, the more certain is the probability of a lasting *splice*. Making a good splice may be resolved into four operations, (1) cutting the film and cleaning the emulsion thoroughly from a suitable

area; (2) applying the cement; (3) holding the splice under pressure and (4) cleaning away the excess cement. The operation is performed with a continuously accelerated tempo, culminating in the speediest possible application of pressure to the film after the cement is applied. The first operation, cutting the film, is more conveniently done with the aid of the knife or cutter incorporated into the splicing machine. If the film is carefully placed on the index pins, the cut will always be correct. Next comes the scraping, which is, perhaps, the most important part of the operation. Place the film accurately in the scraping guide and be sure to scrape away *all* of the emulsion or picture surface of the film. *Cement will not adhere to emulsion.* Consequently, if there are any patches of emulsion left in the splice, they will mean so many weak spots. Be particularly careful to clean the film near its outer edges or around the sprocket holes, as it is here that the patch first begins to weaken. Only one film of the two needs to be so scraped, of course, since the splicer so spaces the scraped area that a perfectly overlapped joint is made if the operator follows directions. Care must be taken that the unscraped celluloid surface of one film is in contact with the scraped celluloid surface of the other. This will, of course, bring the emulsion or picture sides of both films together. In some special cases, as when certain kinds of titles are to be cut in, or a scene is to be reversed from left to right, the uncoated or shiny surfaces of both films may be brought together so that, as the splice passes through the projector, the emulsion changes from one side of the film to the other. In such a case, no scraping need be done, since there is no emulsion to remove between the surfaces in contact.

After the film is scraped and completely cleaned of emulsion, it is placed on the registering pins. The cement is quickly spread on the scraped portion, the second piece of film is laid on it and pressure is applied for a few seconds. Because of the fact that the film cement dries very rapidly

it is imperative that this operation be completed as rapidly as possible. One stroke of the brush will deposit enough cement to fasten the film together. There should not be too much cement on the brush or it will flow on the film too fast and cause an overflow. This will gum the splicer and weaken the joint by softening the film adjoining the splice. Film cement is a solvent and not an adhesive. That is, it melts the film pieces together and does not stick them together, as an adhesive would do. For this reason, care should be taken not to get cement outside of the area of the splice.

After removing the splice from the clamp, examine it to see if a neat job was done. Many times, it will appear to be coming apart at the edges. Sometimes a bit of cement carefully applied between the films will correct this. The perforations should be clear and not filled with flakes of cement, nor should there be any "tails" of dried cement on the edges of the film. Keep the fingers off the picture area and remove surplus cement with a lintless cloth, if necessary. With a properly made splice, there should be no cement showing after the clamp is removed. Test the splice with a good, steady pull, after it dries, which should be in about thirty seconds. This will prevent its parting in the projector.

Some splicers make diagonal splices and other straight across. Each has points in its favor and each will hold well, if properly made. When difficulty is encountered in making a splice hold, it is generally because of the fact that the emulsion has not been scraped clean. With the newer films, it is a good idea to take the unscraped film and paint the glossy side (opposite side from emulsion side) with a thin coating of cement, wiping it off before it dries. This removes the traces of black backing that are found on the film after processing. It makes a firmer splice.

Handling film in editing

There are many simple devices for handling the short strips of film during editing. Some of these are egg boxes,

pill boxes and typewriter ribbon boxes; many other ideas will occur to the amateur. Some prefer to hang the strips from a horizontal rack or cord, by spring clips. Tight, metal containers, however, are best for short lengths that are to be kept unspliced, for any length of time. In all questions involving the mechanics of editing, the main point at issue is that the separate scenes, or film cuttings, be catalogued so that they may be found easily, when needed. Any mechanical system for accomplishing this purpose will well repay its working out, in ease of editing and smoothness in the finished film. The editing, once planned, remains largely a mechanical job and is best accomplished by mechanical means. On the editing bench, everything should be kept in its place at all times, so that the worker will become accustomed to making certain motions for certain purposes and so that no lost effort will accrue. This is the secret of easy editing. The professional film editors have reduced this to a science and certain amateurs have gone far toward equalling this precision. A special "editing table," where everything may be fastened down in the proper place, is a wonderful help and may easily be made from a cheap, pine, kitchen table. Film clippings are best disposed of in a metal waste basket; the type of small kitchen can, with a lid that opens by foot pressure, is admirable for this purpose. Above all—SYSTEM is the thing that makes splicing easy.

Making doubly sure

It has been said that shooting an amateur motion picture is only half the job. In other words, the picture in its unedited state is "half shot." Although this is putting the case rather strongly, there is more than a grain of truth in it.

Editing, or the rearrangement of film that has been taken, is the movie amateur's second opportunity to eliminate faults in the film and to work out a logical, coherent thread of interest for it. The first opportunity came while the film was being exposed; now that the exposed film is

before him on the splicing table, there is a chance both to bury his mistakes and to improve the arrangement of his successes. This faculty gives the amateur an opportunity that is scarcely paralleled in any other pictorial medium. After a picture is painted, for example, it would be rather difficult to rearrange it and, after a still photograph is developed and printed, not much more can be done, except to retouch it. But the amateur movie maker is much more fortunate. After his film is exposed, he can entirely alter the original plan of it, if he desires; he may combine two reels into one or separate one picture into two. If he has a library of his own films, he can cull out stray shots from other reels to fill into the one on which he is working. He can make any combination that his heart desires simply by clipping his film with a pair of shears and resplicing it together in a new order. Needless to say, there is not often need for such drastic steps but, sometimes, this very facility really makes the picture.

The film to be edited will probably be in hundred foot (fifty foot "Eight film") lengths as it has come back from the processing station. The first step is to set up the projector for a short throw and conveniently located on a table. Slowly screen the film to be edited, viewing it as critically as possible while so doing. As the film passes through the projector, note the faults briefly on a piece of paper. It is best to project the picture two or three times to familiarize yourself with it completely. Make a note of all badly over exposed or under exposed scenes, wobbly places or those where the camera has been jerked or unevenly and too rapidly "panoramed." Check up, in the notes, the shots that are out of focus and all other instances of bad photography. Then strengthen your will power, take the reel off the projector, placing it on the rewind, and run through it, clipping out all of these bad bits with a pair of scissors. One will be strongly tempted to leave indifferent scenes, to make allowances for bad photography. It seems a shame, at the time, to throw away

the film. The finished picture will be much better for the clipping because, if the bad photography is left in, it will lower the level of quality of the whole reel. It will interrupt some of the best shots and spoil the entire general effect.

Two or three very bad shots can leave a poor impression of a complete 400 foot reel (200 foot "Eight film") of otherwise good pictures.

In cutting out the scenes photographically below standard, one will, of course, also trim out the few frames at the end of the reel, bearing the laboratory date mark. As one makes these eliminations with the scissors, he automatically cuts the film into sections. These sections may be rolled up and hung on pegs or placed in the cells of egg boxes, in the order that they came from the reel. Then, in making up the new reel, they will be convenient for splicing back again in the same order, if that is desired. If there are not many eliminations to be made and if the reel has been taken in almost the exact order in which it is to be shown on the screen, the film might immediately be spliced together after cutting out the scenes or bad frames to be eliminated. This makes editing a remarkably simple task but, of course, it means that the picture must have been planned in advance along some definite thread of interest, in order that it may have any screen coherence. When the nature of the picture, its simplicity or the care in following some definite plan makes editing so easy a job, there are but two cautions to consider seriously. One is to be certain that the work is not so casually done that a few failures have been left in—some fuzzy scenes, a jiggly bit of panorama or an unpleasant glare of over exposure. The other is to examine the film carefully, after the eliminations have been made, to be sure that the absence of some scenes, or one necessarily cut short, has not broken the smooth flowing progress of the story or idea of the picture. If this has happened, it may be possible to take another scene later, to fill in, or it may be better to make some other arrangement of the sequence to cover the loss.

It may be practicable to cull a shot from another reel to fill in. Remember that editing makes it possible to splice scenes together so that they will follow one another immediately on the scene without the slightest break, in spite of the fact that the scenes may have been taken, actually, months apart and in entirely different localities. Thus, for example, suppose that we are editing the film story of *Junior at the Beach*, mentioned in the first chapter. It might be necessary to cut out the whole beginning sequence of Junior getting into the car with his parents, because of bad under exposure or some other accident. We still want to establish Junior as the hero of our film story and the closeup of him getting into the car went far to achieving that end. It might be convenient, the next day, to "fake" the missing sequence by asking Junior's mother to drive the car around the side of the house and getting a closeup of Junior as he clambers in, to sit beside the driver. On the other hand, this might not be possible. We should then have to look over another group of shots of Junior, made previously. We might find a very good one of him seated in the car, ready for an entirely different trip and we could clip this scene from the reel of "pot shots" and splice it in as the introduction to our film story of *Junior at the Beach*. With a longer and more complicated film story and with a larger library of "pot shots" to draw from, of course, this principle can be used in a variety of ways. Incidentally, in the professional motion picture business, there are "stock libraries" that make a practice of gathering and indexing shots of fires, city streets, boat wrecks and similar things. Photoplay producers buy these shots and, in editing, insert them at appropriate places in photoplays, thus saving the money necessary for staging them again. An amateur movie maker, editing a family film or a similar picture, may well regard all of his reels of "pot shots" as just such stock libraries from which he may draw at will in order to fill out a sequence.

Titles

Editing also calls for the addition of titles. These are not only valuable in themselves but they make editing easier. The use of the title is familiar to everyone, because of the professional motion picture. The title is an enormous help in telling a story or maintaining a connected thread of interest in amateur movies. It will bridge a gap in the picture, explain sudden shifts of subject, identify the people in the picture and generally help in the smooth flowing presentation on the screen. A well titled reel rarely calls for running comments from the maker during the projection. The titles fill in the gaps in the picture that would otherwise require verbal explanation and they make the movie a self contained unit that will have meaning for anyone, without outside interpretation. There will be no need for a member of the audience to ask, during the projection of a travel film, "Is that Juan les Pins?", or in a family picture, "Where is Junior now?" The titles will answer these questions, if the questions are at all important to the understanding of the picture. The aim of all good titling is to fill in the meaning of the film, where necessary. Although the pictorial medium is very broad in scope and although it is very powerful, it does have its limitations. If, for example, we are making a film record of the babyhood of the daughter of the family, titles can best date the sequences to preserve that important information for parents and friends. In such a film might come the title, "*During her third year, Barbara makes her first trip to the 'Zoo'.*" This explains the sequence to follow and it dates the picture, including information of great importance in years to come.

Although, in working out a theme for a picture that one plans to make, one can count on using titles to help carry along the story, it is best not to choose the exact wording until the editing process is reached. Then, after the bad

scenes have been eliminated and the reel is in the order in which it will be projected, run it through the projector and study it, to decide what titles will be needed. It is better to use too few titles than too many; in the average family reel, it will be found that not many titles are needed to make the story clear. In the picture of Junior's trip to the beach, it would be possible to do without titles entirely, while, on the other hand, they might make a decided improvement. In the sequences taken at the beach, a title such as *Junior has his first swimming lesson* might have considerable value.

Titles are spliced into the reel, immediately before the scene or series of scenes to which they refer. One may make them himself or have them made very inexpensively by a large number of firms that supply this service. In Chapter III there are simple directions for making your own titles as well as a much more complete discussion of writing good titles.

It is a general practice to give a *lead title* to a reel as a whole. *Junior at the Beach* is such a title. It might be hand lettered on a suitable *art title background* (a still or an animated photographic background harmonizing with the thought of the title, upon which the lettering is superimposed) making a very attractive introduction to the picture. Clever, well lettered titles, against a suitable background, furnish a setting for the picture that the audience is certain to appreciate.

Carrying editing further

The point was made in the first chapter that there are two ways to bring order and coherence to films, first, through advance planning and, second, through editing. It was stated also that the best method is a combination of the two. The editing so far discussed presumed that the picture was worked out in advance and that there was little left to do in editing, except to cut out the bad scenes and to splice the film together.

Even if we planned the picture, basing it upon some theme, it may require more than that. For example, in a picture of a vacation trip by car, a change in plan meant that some of the scenes throughout had to be foregone, while unexpected filming opportunities came during the trip. If that is the case, as it is very likely to be, the picture will involve uncertainty, as most do. Let it be understood that no one would advise foregoing a splendid movie shot just because it did not fit in with the particular plan of the reel that the amateur happened to be using at the time. One is bound to encounter unexpected movie making opportunities and one always wants to make the most of them.

Splendid as may be the stray, unexpected shots that come our way, it is quite possible that they will not fit into the reel just in the order in which they were made. Beautiful as they are, they may, on the screen, make for the same chaotic effect that was mentioned earlier. There is nothing for it but to cut them out and fit them, perhaps, into some other sequence in the picture where they serve better, or to use them in some other reel entirely. This means a slightly more ambitious plan of editing. Again, if we have not made an advance plan and have left the arrangement of scenes until the editing, this will also call for a more ambitious attack.

The philosophy behind the more elaborate type of editing is to treat the film material before one with a fresh approach, to consider the possibility of all scenes and sequences with a new eye and to try to work out slightly different and better combinations of scenes into sequences. If the picture has been filmed with an advance plan, of course, one will follow it and will try only to better the sequences that make it up, in order to improve the presentation of the idea or theme originally conceived. If, on the other hand, the picture has been made without any plan, in the editing we shall try to devise some order for the scenes. Both of these require as impersonal a mind as one

can muster and we must forget the exact order in which the shots were originally made, to look for new combinations that will have more meaning on the screen.

The most important preparation is to approach the job as one would approach a game of bridge or a crossword puzzle. This type of editing is very much like a game in which the object is to see who can make the best and largest number of sentences from a definitely limited number of words. There are infinite possible combinations but not a large number of very intelligent ones.

The routine part of the work is very simply and quickly accomplished and the remainder of it is a matter of pitting one's intelligence against the unsorted lengths of film to make of them something understandable and interesting.

Since we are to deal with quite a number of lengths of film, each different in some way from the others, it is necessary to employ some sort of system that will reduce the job to the least involved basis and that will prevent confusion and waste of time. A simple system of organization will be suggested. It is subject to the amateur's own improvements and variations to meet individual habits.

First, very slowly run the film through the projector and, as each scene comes on the screen, examine it carefully and make a note that will identify the contents without the necessity of examining it again. This description may be very brief—in some cases as little as a single word. Make the description as impersonal and objective as possible, taking care to read nothing into the scenes that is not actually there. For example, if there is a shot of a friend in your garden walking toward his dog and the dog is not in the picture, do not write, "Tom walking to meet Rover," but, rather, "Tom walking in garden." Note the setting and the persons in the picture and make any brief comments on the scene that might be helpful, but take care not to read anything into it that is not actually there. This will start one thinking in terms of the pictures themselves,

rather than in terms of the conditions under which the pictures were made. Remember that, on the screen, the audience only sees the pictures—they cannot possibly be aware of anything that is going on just outside of the camera's range. While examining the scene, note any imperfections that may have damaged a part of it. It is also useful to add a note about the value of the scene, whether it would be useful in full or in part and whether it is long or short. Most scenes can be improved by a bit of trimming. Head each note with a number, so that the list of notes will each bear numbers referring to the scene's position in the reel before being worked on. In working with the film, we may at any time use the list of notes instead of the film itself, for each note will carry a ready reference number that will locate on the reel the scene to which it refers. The advantage of this system is that, if any extensive rearranging of the picture or of a part of it is indicated, tentative trials may be made without cutting the picture entirely into separate scenes. Further, the short, impersonal notes enable us more easily to get a new viewpoint for the scene than we could if we saw the picture itself, because then a flood of memory of the exact circumstances in which the scene was made would take the front stage in our minds.

The notations for a family film might read as follows:

1. Children playing on lawn; distant shot. Cut first two feet. (Bill jumped in front of camera.)
2. Closeup of Mother in porch swing (good).
3. Mother standing on porch, gesturing (very good).
4. Baby pulling weeds in garden (good, but trim last part—fogged).
5. Near view of Bill, soaking wet (cut jiggle at end).
6. Boys playing with hose (O. K.).
7. Boys drop hose and run. This treatment would be continued on through to the end of the reel and, when the scenes are all listed on paper, it is time for the next step which will require some more paper, a pencil and some keen brain work.

Read over the list of scenes carefully and try to figure

some combination of them that will have meaning and will tell a little story. If the picture has been planned in sequences, this will be a great deal easier, for there is a rough mould for our thoughts as we edit and we can concentrate on one particular line. Even if the picture has been carefully planned, improvements will occur to the editor as he studies over the list. If there has been no advance plan, the job will be one of trying to make some kind of story out of the scenes.

After an arrangement has been selected, then list the scenes in the new order on a separate sheet of paper, still retaining the numeral notations at the head of each scene description. A part of the final editing sheet of the above list of scenes might run as follows: 2. Closeup of Mother in porch swing. 1. Children playing on lawn. 6. Boys playing with hose. 5. Near view of Bill soaking wet. 3. Mother standing on porch gesturing. 7. Boys drop hose and run. We have thus made a little story out of the incident. It is possible that Mother was not actually gesturing at the children to leave the hose alone, in our scene of her, but the scene spliced into the picture at that particular point would convey that idea. In this arrangement, we have held out the scene of Baby pulling weeds in the garden and it will be used in some other sequence where it will fit better.

It is easy to understand that this rearrangement of scenes is the most important part of editing. It is the brain work that makes the film. All sorts of unexpected stories can be worked out and, when stories are not indicated, sequences can be assembled.

With the aid of titles one can go still further. For example, the listing of scenes of a fishing trip might yield the following: 1. Jack reeling in a fish. 2. Closeup of Jack holding the fish. 3. Jack casting. 4. Bill casting. 5. *Reverse motion* shot (see Simple Tricks, Chapter I) of Bill throwing fish back in (fish jumps up to his hand). 6. Second reverse motion shot of Bill throwing fish back. 7. Bill leaning

against a tree, looking at water. 8. Bill casting again at pool. With the help of titles, on our editing sheet this could become: 3. Jack casting. 1. Jack reeling in fish. 2. Closeup of Jack holding fish. 4. Bill casting. Title 1. *Bill has no luck.* 8. Bill casting in pool. 7. Bill leaning against tree, looking at water. Title 2. *But Bill's luck changes!* 5. Reverse motion shot of Bill throwing fish into water. It appears to leap into his hands from the stream. 6. The same action.

With the aid of the titles, this second arrangement tells a little story. Several similar but longer ones have actually been worked out by movie making anglers as jokes on their friends. The story is secured through the editing and, of course, the "actors" had no idea of the possible plot when they were being filmed.

In editing it is often possible to split a long scene into two sections to be used in different parts of the film. It is convenient, when scenes are subdivided, to identify the parts by letters. Thus, a long scene of the car on a country road might become: 14 a. Car on country road. 14 b. Car on country road. In a film of a vacation automobile trip, subdivision of this very scene might come in handy. For instance, in a trip from one town to another, there might have been ample opportunity to get footage of roadside scenes. On another lap in the journey, the weather did not permit filming. In editing the picture, it looked awkward to run sequences of two different towns in succession. To solve the problem, an earlier scene might be divided and a portion spliced in where needed to carry the story along.

Often the material of the film indicates a less dramatic sequence than those given as examples. We might have the following scenes with which to deal: 1. Bob coasting down the hill on his sled. 2. Long view from the bottom of the hill. 3. Closeup of Bob holding his sled. 4. Bob landing at the bottom of the hill. This could be very easily rearranged in a better sequence as follows: 3. Closeup of Bob holding his sled. 1. Bob coasting down the hill. 2. Long

view from bottom of hill. 3. Bob landing at the bottom. This would be a more natural order with which to carry the interest of the audience along.

If one is editing a film of fifty or more scenes, by the laws of permutations and combinations there are many thousand different, possible arrangements. It would be folly to try to think of them all, but somewhere, among the more obvious arrangements, is one that best suits the picture being edited. The goal is to discover it or to come as near to it as possible. The way to achieve it is to look for logical sequences or for series of scenes that will build up a set of connecting links for the picture.

After the editing notes have been arranged in their final form, the movie maker will have a complete picture on paper of how the film will appear on the screen. The next step is to divide the film into scenes. This can be done easily with the aid of a small viewing glass and a pair of shears. Some editing devices have a viewing glass conveniently attached. As each scene is separated from the parent reel, roll it up and place it in the numbered pigeon hole of an egg box or, if a board with pegs is to be used, place it on a peg. A comparison with the number of the cell of the egg box, or the number clipped to the roll, with the corresponding number on the final list of scenes will tell what any particular film clip contains without the necessity of unwinding it and examining it.

Then, with the final editing sheet used as a guide, reassemble the scenes in their new order. This will be a simple, mechanical task of splicing one scene after another. However, it is wise to project the partially completed film at various stages during the process and to ask oneself if one scene flows smoothly into another. It may be necessary to change the order a bit more. On occasion, some clever idea worked out on paper does not come out so well in the actual film and it will be desirable to work over that section of the picture a bit more.

During the projections of the partially completed reel, it is also useful to ask oneself the question, "Can any scene be trimmed effectively?" At the end of the reverse motion shot of Bill catching fish with his hands, for example, there may be an extra foot or so where Bill is standing and waving his arms in a manner that appears unnatural, due to the reverse motion. This would be trimmed at once. In another case, at the end of the scene of the boys running away from the hose, there may be a couple of feet, after all have left the camera's range and nothing is happening, giving just footage of the garden and the dropped hose. It should be trimmed too, for such extra bits of unneeded footage will make the picture drag.

Editing is more than a refinement; it is an important ingredient of good picture making. Some will go so far as to say that a picture is actually made on the splicer, but there are many amateurs who hesitate to edit at all. Viewed from a distance, it may seem something of a task but, in actuality, editing is a clever game that has for its reward the pleasure of improving any picture or the even greater satisfaction of making a picture from nothing but random shots.

CHAPTER III

GETTING INTO THE STRIDE

Lenses and their uses A description of the function of the lens will be of help to the amateur in understanding its use. The lens is made up of carefully ground elements of optical glass cemented together and held in a tube or barrel, as previously explained. The function of this assembly is to collect and direct the rays of light reflected from the object to the film. This means, of course, that the size of the object must be greatly reduced. Refraction, or the bending of light rays, is utilized to make this possible.

When light passes through substances of different densities from that of air, the light beams are bent. This is best shown by looking into a glass vessel, such as an aquarium, and noticing that the line of vision is changed when looking through the water. The lens does to the light the same thing that water does but, of course, with much more dependable results, because of the careful grinding of the lens elements. Thus, we can see that the beams of light reflected from the object are gathered together and projected on the film, forming there an exact reproduction in miniature.

We have, now, at a certain distance back of the lens, a small image of our illuminated object. Why is this image so much smaller than the object? Because the lens is arranged to bend the rays of light quite sharply, so that they converge to a point only a short distance behind it. The size

of the image, therefore, compares with that of the object in the same way that distance from object to lens compares with distance from lens to image. From this, we might assume that, if we make a lens to cast an image farther and farther back, our image would grow larger. This is actually the case; such a condition is realized in the long focus or *telephoto lens*, which, as everyone should know, is farther from the film and forms a larger or more magnified image.

We are now ready to understand the real meaning of the word "focus." This refers to the distance from lens to image, but, since the image is to be impressed on the sensitive surface of the film, it is important that the lens be so adjusted that the image it forms will fall on the sensitive emulsion in the sharpest and clearest way. The image, then, is focused on the film when the lens is at such a distance from the film that the sharpest possible image of every point on the object will coincide with the emulsion surface. In view of the fact that this distance varies as the distance from the lens to the object varies and since it is better to hold the film steady and rigid during exposure, we alter this distance by moving the lens bodily toward or away from the film. This is called focusing.

The purpose of focusing, then, is to make every point composing the image as sharp and as small as possible. This is the ideal condition; in practice it is found that the lens has certain inherent distortions or *aberrations* of which it is both impossible and unnecessary to rid it, so that these points are not really points, but very small circles. The image, then, is made up of an infinitely fine mosaic of these overlapping circles. They are known as the *circles of confusion*—incidentally, a very appropriate name, for it becomes evident that, as the size of these circles increases, the image becomes more and more blurred and confused, especially when recorded on the film and later magnified to such a tremendous extent on the screen. We now see why it behooves us to exercise care in focusing, for we get the

best defined image when the circles of confusion are of the smallest possible diameter. We are aided in this by the focusing mount, which is a mechanical arrangement, usually in the form of a knurled ring, for moving the lens toward or away from the film. The amount of lens movement is carefully indexed for us on the focusing scale, which is marked with numbers indicating the proper lens setting, when it is desired that the image of an object at a given distance away shall appear sharp on the film. This scale has been accurately calibrated by the lens maker and should be followed carefully.

As the object on which the lens may be focused recedes to an increasingly greater distance, the angle at which its image producing rays strike the lens becomes less and less acute. Finally, a certain remote distance is reached, beyond which this angle changes so little as to become practically constant. If the angle at which the rays enter the lens becomes unchanged, the lens will continue to bend these rays always in the same direction; consequently, the image will remain at a fixed distance behind the lens, no matter how much more the actual object recedes. When this condition occurs, the object is said to be an infinite distance away and the lens is said to be focused at "infinity." Once the object we wish to focus reaches or passes this distance, the lens may be set permanently at a fixed distance from the film. For the usual one inch $f/3.5$ lens used in 16mm. cine work, an object at a distance of fifty feet or more may be assumed to fulfill this condition. This gives us an excellent means of defining the focal characteristic of any particular lens. We simply focus our lens on infinity and then measure the distance from lens to image, which we have seen to be constant under this condition. Therefore, this distance will be a permanent attribute to that lens and will give us a means of describing it. This we do by naming this distance the *focal length* of the lens. As above mentioned, the normal lens used in 16mm. cine work has a focal length of twenty five

millimeters, or about one inch. There is no arbitrary or magical quality about this particular focal length, which would make such a lens better than all others; it merely has been found that a lens of this focal length produces an image of such a size upon the 16mm. frame that the field of view embraced by the human eye is most naturally reproduced.

With this well in mind, we are now ready to proceed to an understanding of the lens diaphragm and of how it affects our focusing problem. A description of the mechanical aspects of the diaphragm has already been given. The diaphragm has two important effects on the performance of the lens. First, as it opens or closes, it allows more or less light to reach the sensitive emulsion of the film. If our scene is brilliantly illuminated, the light which reaches the film may be so strong as to affect the emulsion too radically. We then say that the film is over exposed. In order to prevent this, we close the diaphragm to a point where it will admit only the correct amount of light necessary to expose the film properly. Conversely, if the light on the subject is poor, we shall want to open our diaphragm to let in as much light as possible. Thus, in order to get the best possible image on the film after processing, we should know just how to set the diaphragm in order to admit the correct amount of light under any given outside lighting condition. Since there is an indefinite number of variations in lighting conditions, it might be supposed that the diaphragm setting for proper exposure could only be determined after long experience. In practice, however, one soon acquires the knack of making very satisfactory approximations. Moreover, the latitude possessed by the sensitive emulsion, as well as the corrective effort of the reversal process, does much to compensate for errors in exposure. Nevertheless, the amateur who takes pride in correct exposure, as an important link in the operation of picture production, will do well to make use of a good exposure meter. This instrument will

materially reduce the chances of his going astray in this direction.

The second of the important effects of the diaphragm opening in lens performance is its direct bearing on the focusing problem. As the diaphragm is opened, of course, more and more of the actual lens area is brought into use. This means that there is more chance for the introduction of some slight distortion into the image. Since it is impossible to grind the lens with absolutely perfect uniformity over its entire surface, as more of this surface is brought into use, there is increasing chance for the introduction of irregularities. This is why the ~~fast~~ lens is usually more expensive, since it is to be used at a wide aperture and must be carefully ground and corrected accordingly. All other things being equal, we should, therefore, bear in mind the following fact, no matter what lens we are using. *The image grows sharper as the lens aperture is decreased, that is, as the stop number is increased.*

Let us see how this fact will affect our lens setting for distant objects—the “infinity” focus. When the lens is set for infinity with the diaphragm wide open, we have seen that the image remains sharp, no matter how far beyond this limit the object recedes. Now, if the diaphragm opening is made smaller, thereby increasing the tendency to make the image sharper, the result is that the infinity limit is decreased. To take a specific example, a one inch lens, open at $f/3.5$ and focused at infinity, would produce a sharp image of all objects from seventy five to one hundred feet away, or farther; the same lens stopped down to $f/5.6$ would bring this infinity limit down to fifty feet and a further decrease in lens aperture would make it even less.

“This,” says the reader, “is all very practical for workers in landscape and for those who wish to take pictures of the distant mountains, but is there not some similar system, some diaphragm and focus combination, which enables me to set my lens quickly for the average view or semi long

shot?" Precisely the answer to this requirement has been evolved by the lens technician and he refers to this adjustment as being the setting for *hyperfocal distance*. Without going into the technicalities of this resounding term, let us consider its practical definition. *It is the distance at which the nearest object can be focused sharply, while distant objects still retain satisfactory definition.* (By definition is meant sharpness of focus and consequent clearness and sharpness on the screen.) The hyperfocal distance of the one inch lens is about fifteen feet, but here, again, this distance increases as the stop number increases. As we have already said, this distance is such that objects fifteen feet away will be sharp in focus, but, in practice, it has been found that objects will still be in satisfactory focus for general work when half that distance from the camera. In this way we can quickly estimate how close the subject may approach the camera, when using any lens thus fixed, if we know its hyperfocal distance. Particular attention is called to the radical effect produced by diaphragm changes.

The result of closing the diaphragm on the infinity setting and the hyperfocal distance would naturally lead us to assume that this sharpening of image caused by decreasing the aperture holds true for any lens setting. Such is the case. As the aperture decreases, the depth of field is increased—that is, for any given lens setting, the distance is increased through which an object may move toward or away from the camera and still remain in satisfactory focus. Thus we see how a decrease in lens opening improves what might be termed our "tolerance of focus." It is obvious, then, that, wherever possible, it is best to choose a subject with plenty of illumination in order to gain the advantages in tolerance and depth of focus which are given by the small diaphragm opening.

It follows from this that it should be possible to fix a lens permanently in such a position that it will give fairly satisfactory all around results without the necessity of fo-

cusing at all. This is actually the condition realized in the fixed focus or universal focus lens. Just how completely satisfactory is the fixed focus lens and will it provide an image good enough to justify dispensing with the focusing mount entirely? This is one of the most important questions that occur to every practically minded amateur who considers the purchase of a new camera. Let us, therefore, conclude this simple discussion of lens theory by considering this oft debated question from the practical standpoint of results achieved. The fixed focus lens must be assumed as ideal only for certain definite conditions. For other conditions, equally important but not quite so common, this setting is at best a compromise. The critical focus of which the lens is capable may be had only when the object is at a certain range of distance from the camera. This range cannot be moved as a unit, as it can with the focusing lens. Outside this range, the fixed focus worker must always face the knowledge that his image could be rendered with better definition, were his lens in a focusing mount. Closeups in good focus are impossible unless an auxiliary element, called the *portrait attachment*, is clipped over the lens mount to change the focus. This operation probably causes about as much extra effort as would be required in focusing the lens. Moreover, it is sometimes desirable, for the sake of emphasis, to focus sharply on the object and have the background out of focus, so that it will not be too apparent in the picture. This is called *differential focusing* and adds much to one's cinematic resources. It is, of course, limited to the focusing lens. Certain lenses, however, are provided with a closeup focusing range in combination with a fixed focus setting. Such a mount is, of course, an improvement over the stationary one. Finally, it is possible to use the focusing lens as a fixed focus objective for emergency or rapid work simply by setting the focusing scale and diaphragm at predetermined indices, usually twenty five feet, at $f/5.6$ for the one inch lens. The fixed focus lens is, in gen-

eral, for the use of those who do not care to develop camera technique and who "do not care to bother with focusing," with all that this resolve implies. The focusing lens of a given speed can do all that the fixed lens of the same speed can do, while the fixed focus lens must be denied a part of these accomplishments—sometimes a part that is most especially desired.

Since most amateurs will have one or more lenses of different speeds and focal lengths to aid them in their movie making, the remainder of this discussion on lenses will be devoted to a consideration of the normal, fast, short focus or wide angle and telephoto lenses.

Normal lenses

By far the most common lens attached to the amateur 16mm. motion picture camera is the so called "ordinary" lens of one inch focal length and with the widest diaphragm stop of $f/3.5$. The characteristics of such a lens are of a kind to make it suitable for all subjects, at an average distance away and under usual lighting conditions. The ability of the $f/3.5$ stop to cope with all average lighting conditions has already been discussed under Exposure. For the rest, the focal length provides a picture on the film which includes an angle of approximately thirty degrees, extending outward from the camera with its apex at the lens. The amateur need not worry much about the precise position of this "lens angle," because the finder will show him the extent of the picture as it will appear on the screen under all ordinary conditions. (See the discussion of Titling later in this chapter.) Precautions concerning handling the lens in taking a picture, given in the earlier part of this discussion, apply, of course, to the one inch lens as well as to any other. At the same time, this lens is of a focal length that will permit a certain degree of leeway in adjustment, but it must be remembered that, all other things being

equal, the finest adjustment gets the best picture. The one inch lens may be had in focusing or non focusing mounts; the latter type is usually provided with a closeup auxiliary lens attachment, so that the closeup objects within certain limits can be taken. When the lens is used as a universal focus objective and is set at stop $f/3.5$ or smaller, objects may range from a distance of five feet to infinity toward or away from the lens and still be in satisfactory focus. At smaller stops than $f/5.6$, an object can approach closer to the camera and still deliver a satisfactory image through the one inch lens. Bearing in mind that the more careful the adjustment, the better the picture, the one inch lens in a focusing mount is desirable for more careful workers. Lenses of this type are usually graduated from one foot to infinity and it will be seen that this gives a wide range of critical focusing opportunities. Moreover, the one inch lens may always be used as a universal focus lens if required. This is done by setting at its hyperfocal distance or at about twenty feet. Under such conditions, the lens will function exactly as does the universal focus objective. When traveling under conditions where quick emergency shots may be desired, one amateur has secured his focusing mount lens temporarily in the "universal focus position" by means of adhesive tape.

Fast lenses

As has been noted previously, fast lenses are those with stops wider than $f/2.7$ or thereabouts; these lenses, when wide open, have certain definite characteristics which the amateur should know. In the first place, because of an optical law, the fast lens at wide stops focuses very critically; therefore, fast lenses are always sold in micrometer focusing mounts. As with any lens, and especially with a fast lens, this criticality of focusing increases as the object focused upon approaches the camera. It is, therefore, well

to be sure of the distance from object to camera, when using a fast lens. Fast lenses, too, are more susceptible to any stray light which may touch them. Hence, they are provided with deep *lens shades*, in order to protect the large diameter of the lens glass from extraneous side light. Although so protected, one should be especially careful with fast lenses to prevent any brilliant light source from shining directly on the glass of the lens. This is very likely to cause a *flare*, a general foggy or misty effect in some local part of the frame or over the whole picture. With regard to the comparison between fast lenses and those of normal stop range, the question often arises as to why the fast lens alone cannot be used as an all around objective. The fast lens, of course, contains stops of $f/3.5$ and smaller, as well as faster ones; therefore, it is argued that the fast lens could be used exclusively to take the place of the slower one of the same focal length. While modern fast lenses are made to give good results at any stop, it is felt by photographers of experience that the fast lens should be kept and used mainly for the purpose for which it was made, namely, to give good exposure under difficult lighting conditions. It will be found in many instances that the range of smaller diaphragm stops on the fast lens does not extend as far as that of the slower $f/3.5$. Without discussing any individual lenses, it is recommended that, for the best results, the $f/3.5$ lens be used for all lighting conditions within its range and that the fast lens be used to provide a picture under conditions of unfavorable light, which would be impossible with the slower lens.

Wide angle lenses

These objectives are simply lenses of shorter focal length than one inch, which means that the lens, as a whole, is set closer to the film. Remembering that the frame of the picture in the camera—the camera *aperture*—is always of the

same dimensions, it does not take much of an incursion into the realm of plane geometry to figure out that such a lens, placed closer to the film, will take in a wider angle of view than will the one inch lens. Further, this lens exaggerates certain favorable qualities already found in the normal objective. Because of its shorter focal length, it may more easily be used in a universal focus mount and, with it, objects may approach as close as three feet from the camera and still be in satisfactory focus. For this reason, *short focus lenses* which are not definitely fast are almost invariably used in non focusing mounts, but the wide angle lens of wide aperture should still be in a focusing mount, because any lens at a wide aperture is critical of focus. Short focus lenses are usually to be had in two focal lengths, twenty millimeter and fifteen millimeter. It must be remembered that the latter will approach very close to the film and that, when used in certain types of cameras, there may be danger that the blade of the revolving shutter may interfere with the rear element of the lens. Careful inquiry from the dealer or manufacturer, before purchasing such a lens, will automatically solve this difficulty. Remember also that, since this lens takes in a larger field than the ordinary one inch objective, the normal finder on the camera will not include the whole view. In certain cameras, auxiliary finders are provided with each lens, so that this presents no difficulty.

Telephoto lenses

It is generally considered that the telephoto lens "magnifies" the view, but this is approaching the function of such a lens from the wrong angle. What such a lens really does is to include *less* of the area of a given view within the confines of a frame which is always the same size; this frame is the camera aperture. For this reason, an object taken with a telephoto lens appears closer and closer to the beholder of the screen image, as the focal length of the lens

increases. Using telephoto lenses, we have a very convenient check on their ability to bring objects closer to the camera by comparing their focal lengths to that of the one inch lens. Thus, with a three inch lens, an object thirty feet away will appear one third of thirty, or ten feet, distant from the camera; with a five inch lens, it will appear six feet away. Telephoto lenses of the longer equivalent focal length are so made that they will be compact in size and less bulky than their focal length would seem to indicate. This is a boon to movie makers and is made possible by the use of certain elements within the lens system. Lenses of focal lengths greater than two or three inches cannot be used in a hand held camera, as their magnifying powers exaggerate the very smallest tremor to a distinct movement on the screen. Such lenses should be used with the camera on some form of steady support, such as a good *tripod*. The telephoto lens is also critical of focus and is always had in a focusing mount; distance from lens to objects should always be estimated carefully. Because their effective diaphragm openings are functions of their focal lengths, fast telephoto lenses must contain objectives of larger diameter which would make them bulky and expensive. For this reason, telephoto lenses are not usually employed in speeds faster than $f/3.8$ or thereabouts, although faster speeds in these lenses are available if desired for some special purpose. Because a telephoto lens is often used for distance work and because distance haze (as previously described) often presents a factor in exposure problems in such lenses, a 3X or 4X filter is usually sold with the telephoto lens and should be used whenever distant views are taken. Telephoto lenses may also be used for closeups of moderately distant objects where it is not desired to bring the camera too close to such objects. This might occur in taking pictures of children, in order to encourage the subject not to become selfconscious. In such cases, the camera should still be used on a tripod and the lens accurately

focused. The rule that a near closeup calls for an increase in exposure applies to the telephoto lens, when used for this purpose, as well as to any other. A mask is usually provided in the finder to define the smaller field of the telephoto lens and, sometimes, auxiliary finders are provided for this purpose.

Fast and telephoto lenses, having threaded (screw) mounts, should be carefully checked, as to the accuracy of their focusing scales, with the camera with which they are to be used. Never buy an extra lens of this type without having the dealer or optical worker apply this test.

Filming indoors without artificial light

Shooting in full daylight, even if that daylight be much subdued, is vastly different from shooting indoors or under a porch, where the direct top light from the sky is cut off. It is this full, diffused top illumination that gives us most of the effective light that impresses the picture on the film; when this light is cut off by a roof or other shelter, the subject may *look* bright but is really deprived of more than fifty per cent of the effective light necessary to take successful pictures.

Therefore, when filming by daylight in sheltered spots, the cameraman should look above to see how much of the top light is cut off. If he is under a porch, he still has much uninterrupted side light to aid him but, even here, he should consider opening the lens up from two to three stops over the setting that he would use out in the open, under the same conditions of daylight. For instance, if using $f/8$ in the open, under a porch roof, at the same time of day, he should open the lens up to $f/3.5$ or $f/4$. If the day is dull, so that the "open air" conditions call for $f/5.6$, or thereabouts, under the porch, he will need a faster lens than the $f/3.5$, for he will have to use the openings $f/1.9$ to $f/2.8$ to get effective results. All of this is because the important top

light is cut off. Sometimes it is advisable, even in daylight, to use a source of artificial light to help out with these porch shots, according to directions which will be taken up later.

These principles will lead naturally to an introduction to interior filming without the aid of artificial light. Here again, the all important top light is cut off with a vengeance, as well as much of the side light. It is wise to use supersensitive film here, not only because a definite use must be made of every aid possible to secure results with the light available, but also because this film has a definite tendency to cut down the flare which is likely to occur when very bright and very dark objects appear close to each other in the picture. In all indoor pictures without the aid of artificial light, it is desirable to make use of a fast lens. The $f/3.5$ may be used under certain limited conditions, however, as will be seen. That portion of the room nearest to the window should be chosen and the window shade should be raised so as to let in all the light possible. The far end of the room may seem bright to the eye, but, in most cases, a picture taken here will result only in blank film. Indoor shots of this kind are best made as closeups of some person or object. This is because a full length object cannot have much freedom of movement without deserting that portion of the room where the effective light is found. Place the subject near the raised window and endeavor to plan the camera point of view so that as little of the actual window and the view outside may be included as possible. This is done because a brightly lighted landscape or exterior would offer such a brilliant contrast to the subject that the former would tend to become badly over exposed if the lens were set for the proper exposure of the subject. Shield the camera from the direct glare of light and endeavor to photograph the subject from the side. The shadow, or inner side of the subject, will appear as jet black and devoid of all detail on the screen unless lightened by the use of a *reflector*, placed just outside of the camera range and so directed as to

turn back the light which comes through the window on the shadow side of the subject. The use of an exposure meter on such a shot will quickly indicate that wide open lens apertures are to be used, very seldom smaller than $f/4$ and, more often, from $f/1.9$ (or faster) to $f/3.5$.

If direct sunlight shines through the window on the subject, the results are likely to be very "hard" and "contrasty," because there is no surrounding light to soften the shadow parts. Here again, the reflector should be used carefully, trying to light up the shadows as much as possible. Shots of this nature, indoors, in direct sunlight coming through a window, are unusual and not often outstanding, because the lighting is very tricky. Shots made near a window with diffused north light are more pleasing, even if they usually call for a fast lens.

Filming indoors with artificial light

The average amateur, after he exhausts the usual number of possibilities in shooting in daylight, casts about for new cinematic worlds to conquer. He has heard about the possibilities of making motion pictures by artificial light but has the idea that there are many insurmountable difficulties involved in such an undertaking. It is to disabuse his mind of such an idea that this is written. Far from being exceptionally difficult, he will find the handling of artificial lighting units surprisingly simple and, moreover, will derive from this extension of his hobby an even greater degree of the fascination and pleasure which make amateur movies so attractive.

The equipment needed by the beginner for successful pictures by artificial light need not be at all complicated. The advent of the supersensitive film together with the low priced *Photoflood* bulbs have made it easy to secure a light source that is powerful and effective for this work. These bulbs are no larger in size than the ordinary sixty or one

hundred watt lamps used in the average home lighting system. At a power rating of approximately 200 watts, they furnish to the amateur filmer a light comparable to that formerly given only by the 500 watt, concentrated filament projection type of lamp.

Several points concerning those Photoflood bulbs will be useful for amateurs to learn before proceeding further. A single bulb is rated at 200 watts, consequently one, two, three or even more of these units, up to five, may be burned on a single circuit (a circuit comprises all of the bulbs controlled by a single fuse in the house or apartment fuse box). However, since not more than three of these bulbs will be needed for any ordinary shot, the amateur is well within the electrical factor of safety when using this number. Of course, all electrical arrangements should be looked after carefully and the user should be at pains to ascertain that there are no loose connections or frayed wires in the circuits where the lamps are used. This holds true of any electrical installation but is especially important in interior lighting set ups, as it is essential that our entire attention be given to the picture and to taking it. Further electrical precautions are almost self evident, but they may be covered here for the sake of completeness. When using more than two lamps, it is better to use two separate circuits, if possible, so that too great an electrical load need not be imposed upon a single outlet. Following this idea, it is better to plug lighting units into a baseboard plug or similar outlet, for the reason that this will be nearer to the meter, which is the main source of electrical supply. The cords used in such appliances as bridge lamps and other light, electrical devices had better be avoided as far as possible for connecting purposes, as these wires are usually made only for light loads. Satisfactory cable lengths, together with the necessary connecting attachments, for our purposes, may be purchased at any electrical supply house at a reasonable cost. Many inexpensive reflectors, with appropriate con-

necting cords, are now on the market for use with Photoflood bulbs and, as these form a most convenient and efficient means of making use of these bulbs, it is preferable that they be employed.

It is well to bear in mind that any incandescent lamp of high wattage will emit a considerable amount of heat; this heat increases rapidly if the space around the bulb is semi enclosed. Inasmuch as the life of the bulb is shortened to some degree by exceptionally high temperature, it is best, wherever possible, to provide ventilation space around the bulb so that a reflector, or other surface, will not come closer to it than one inch. These bulbs, when burning, should be placed in such location that they will receive as little jarring as possible, since, when the filament is hot, it is more susceptible to disturbances of this kind. However, they may be burned in any position. The relatively short life of Photoflood bulbs is sometimes advanced as a point in their disfavor. This might be more valid if the time consumed during the actual picture taking were longer. However, when using the average spring driven amateur movie camera, it is to be remembered that few specific scenes will last longer than half a minute and that only during this time the bulb itself needs actually to be burned. From this it will be seen that, in order to conserve the life of the bulb, it should be burned only during the time it is in actual use, that is, during the filming itself. Lighting arrangements, planned beforehand, should be tested with ordinary bulbs at lower wattage. These may be substituted for the Photoflood bulbs or may be placed in additional sockets, near these, so that the source of light is in approximately the same position. There has been introduced on the market a two light unit which provides for a lower voltage in the bulbs during the arrangement period; this is unquestionably an advantageous device when the life of the bulb is considered. Amateurs who are electrically inclined may work out for themselves a double pole double throw switch-

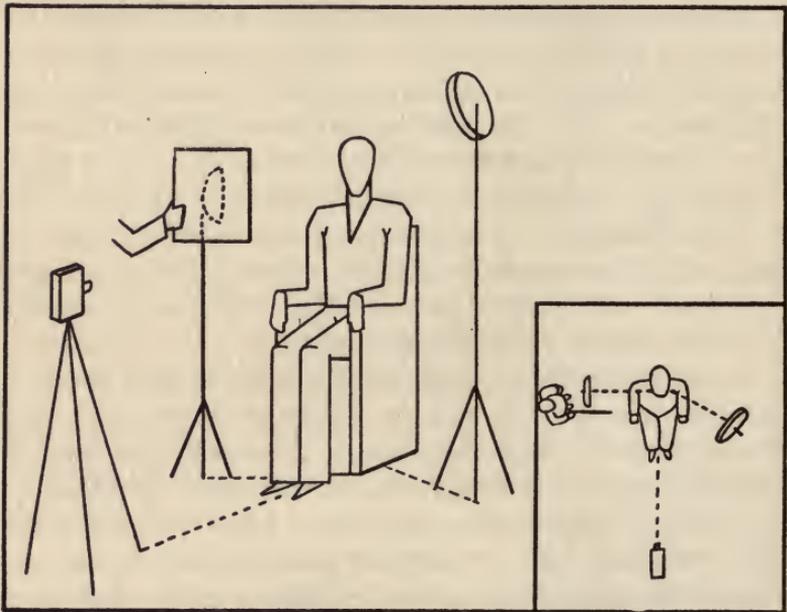
ing arrangement which will connect the two bulbs either in series or in parallel, the former for setting up and the latter for use during filming. This, however, is simply a refinement which is not necessary if the thought is continually kept in mind that the bulbs should be burned at full voltage only while taking the picture.

Having discussed the electrical arrangements, we are now ready to inquire about the quantity and disposal of the light needed for taking the picture. With the new facilities in lighting and speed film, the fast lens for the camera is no longer an absolute necessity. Highly successful pictures may easily be taken with the ordinary $f/3.5$ lens and standard camera. The first question which confronts the amateur, when working with artificial light, is this, "How great an area can I light successfully with the lamps I have?" An understanding of the factors involved in this question is essential before proceeding further; these factors are simple and must be considered here, as they will greatly simplify all ensuing interior lighting procedure.

Since the light that affects the film is the light which is reflected into the lens by the subject, we must not make the mistake of considering that it is the original source of light that counts entirely. We must consider the subject, too. If this subject has a high light reflecting power, we must remember that the film will be affected more strongly than if the subject were dark, regardless of the brilliancy of the original light source. That is why an interior film is much more clear and brilliant if the subject is of a lighter color and is surrounded by an efficient reflecting environment, such as white walls or hangings. Everyone knows that a picture of the baby in the bathtub is much more brilliant and effective than one of the same infant taken in the living room amid the overstuffed furniture. The difference lies in the high reflecting value of the white tile of the bathroom and in the light absorbing (non reflecting) value of the darker furniture. Herein lies the entire principle. The

subject should be chosen so that it will occupy the most advantageous position with regard to its light reflecting value.

With this in mind, we are now ready to consider placing the lights with respect to the subject, a task at once fascinating and susceptible of infinite variations. Many beginning amateurs make the mistake of setting the camera up and of placing the light or lights directly beside or behind



"Forty five degree front lighting" with two lamps. Note the manner in which direct light from the auxiliary lamp is prevented from reaching the lens.

the camera. Thus the subject is illuminated flatly from the front and the resulting picture will be found to possess a curiously flat, expressionless quality. This is true because no modeling is provided by this primitive method of lighting.

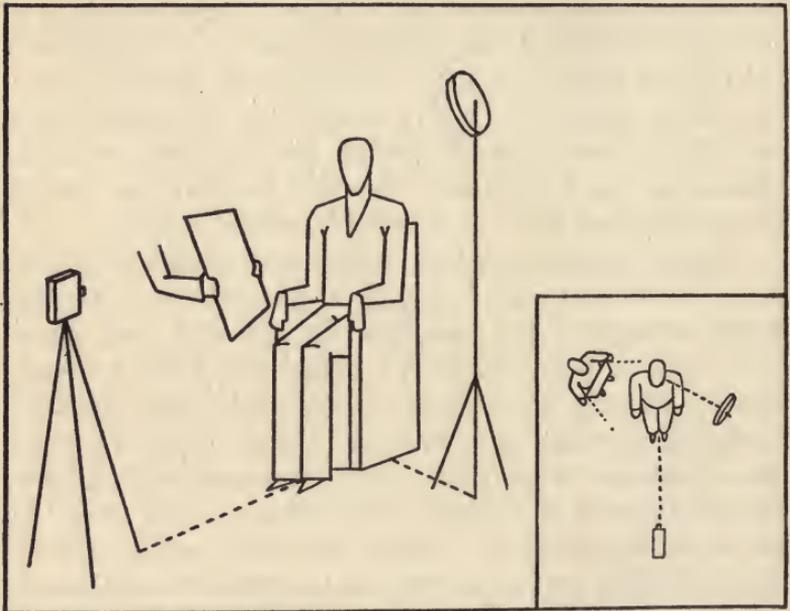
What do we mean by "modeling"? Simply a means for expressing, in the screen picture, the appearance of round-

ness in the subject. The methods of accomplishing this are simple and consist, usually, of the use of two lights. One of these is placed at the side and slightly to the front of the subject, so that the illumination will be greater on one side of the subject than on the other. If only one light were used for this purpose, the shadow side of the subject would appear as black as ink on the screen, since the film has a tendency to lose shadow detail even if the eye can see this detail. To overcome this, an additional light is placed at the opposite side of the subject, so that it will illuminate the shadow detail, but with this difference, that the secondary lamp should be farther away from the subject than the primary one. This will produce the effect of a modeling shadow in the film picture but will prevent the shadow detail being lost in a "soot and whitewash" effect.

This is the principle that underlies all effective lighting, especially in pictures of people. A pleasant effect is given if the stronger of the two lights is placed slightly above the subject's head, while the secondary light is placed slightly lower in an efficient cup or bowl shaped reflector for the lamp itself. In commercial forms of lighting units, this requirement is well met; where lamps are used without the assistance of such units, every means possible should be provided to furnish an efficient reflecting surface around the bulb. This not only increases the effective, directional light but also provides a shield, so that there is less danger of a flare in the lens. Collapsible, silvered cardboard or asbestos composition reflectors are sold for this purpose, which are very effective but, of course, not as permanent as those made of metal.

Having taken the first step in providing a good reflector directly behind the source of light, the amateur should then seek to ascertain what can be done to prevent further light from going to waste. Such a means is provided in a flat, plane white or polished surface of larger dimensions placed in such a position as to catch and turn back upon the sub-

ject the stray light that otherwise might be wasted. A reflector of this nature may consist of a large piece of wall board painted white, a white window shade which may be rolled up when not in use, a sheet hung over a chair or even a sheet of newspaper. Such a surface is placed at the shadow side of the subject and as near as possible thereto, without actually showing in the picture. It is directed so that the



"Forty five degree front lighting" with one lamp and a reflector.

light which falls upon it will serve to illuminate any dark portions of the subject, for we must remember that such portions appear darker to the film than to the eye. Sometimes, even, such an efficient reflecting surface may be used to take the place of a second lamp, to light up the shadow side of the subject. It must be remembered here that a reflector is, in reality, an auxiliary source of light and, as such, must not be turned so that it will reflect light into the camera lens, or a flare may result.

For those who wish it, the following approximate table may be valuable in providing a basis for estimating the number of Photoflood lamps needed to illuminate an average interior subject. Distances given are those from light to subject. Superspeed panchromatic film, the best for all interior work with incandescent light, is employed.

One lamp in reflector	four feet	$f/3.5$
“ “ “ “	six feet	$f/2.9$
“ “ “ “	eight to twelve feet	$f/1.9$
Two lamps in reflectors	four feet	$f/4.5$ to $f/5.6$
“ “ “ “	six feet	$f/3.5$ to $f/4.5$
“ “ “ “	eight to twelve feet	$f/3.5$

Three lamps in reflectors may be used to light an entire room of average dimensions adequately, if the surroundings are fairly light. The use of a good exposure meter will be a valuable check on the diaphragm stop needed in all special cases.

Lights for special effects may be used in fireplaces, high above or below the subject or directly in table or floor lamps, visible in the picture. When used in the last instance, the bulbs should be shaded by lamp shades, or other means, from direct view of the camera. Care should be taken not to place the bulbs too close to paper or cloth shades in a confined space.

Estimates of exposure in this discussion have been based upon the use of supersensitive film, as this film gives the most efficient results under these conditions. Ordinary panchromatic film may also be used under more limited conditions. When using such film, the lens should be opened from one and one half to two stops over the values already given, to get approximately the same results. No film other than panchromatic or supersensitive panchromatic should be used with incandescent light as the source of illumination.

It has not been the purpose of the foregoing discussion to give the amateur, who is interested in interior lighting,

the impression that the Photoflood or "high pressure" type of bulbs are the only ones which can be used for this purpose. Many amateurs will wish to know and avail themselves of the "projection type" bulbs which are those of tubular shapes and which have their *filaments* concentrated in a relatively small area. Such bulbs, in general use for this purpose, are generally rated at 500 watts and 1000 watts. Because of this, more than three of the 500 watt units or more than one of the 1000 watt units had better not be connected to any house circuit. These bulbs are larger and heavier than those of the Photoflood type and are of clear glass, so that the light from them is likely to be "hard" and not diffused. (See Chapter V, Hard and Soft Lighting.) Those who plan lighting set ups which are to remain in operation for a protracted time may wish to make use of these bulbs of higher wattage, because their average burning life is longer (about fifty hours). The 500 watt bulb has the standard "Edison" base used in all home lighting installations, but the 1000 watt unit has the large size or "Mogull" base and needs a special socket. All bulbs of the above type are best used in conjunction with standard home or studio lighting units, including sturdy stand and reflector. Certain of these bulbs may be used as "high pressure" lamps by burning them at a voltage slightly higher than that for which they are rated. For instance, a one hundred volt bulb may be burned on a 110 or 115 volt line, when its life will be shortened to a certain extent but its effective photographic light increased. This use on a higher than rated voltage involves absolutely no danger.

Emphasis with light

As far as exposure is concerned, the subject of outdoor camera work has been fairly well covered previously. Nevertheless, over and above the question of exposure, there are a number of points which, if understood, will serve the

amateur movie maker well in his operations under both cloudy and sunny skies.

The first and, perhaps, the most important of these points concerns itself with *lighting*. One may well question the use of this term under these conditions in its normally accepted meaning, because the term lighting carries with it the idea of controlling a source of light. If, out of doors, this source of light is to be the sun, how can we control it or move it about as we do our indoor lighting units? Manifestly, the idea of playing a Joshua to the celestial source of light is absurd. What we really mean here is placing the subject with respect to the light and the camera with respect to the subject, so that controlled results may be gained.

The amateur snapshotter out of doors has the fixed idea that the sun should shine over his shoulder, full into the face of the subject, causing a bad squint and a deep, inky shadow under the hat brim. Let the amateur cinematographer forget this notion. Light which is shining full on the subject from behind the camera will, in most cases, make that subject appear flat and depthless. Nor is this light necessary for a good exposure on movie film, since this film will record images under lighting conditions of many different varieties. Particularly in taking pictures of people, the cameraman should remember that his first duty is to make them look natural and to make them stand out from their background. This may be done most simply by providing that the illumination which reaches the subject shall come more from the side than from the front. This topic has been discussed more fully in speaking of interior lighting, but the same principles apply when using sunlight as the source of illumination. Side lighting upon a subject means simply that one side of the subject is illuminated more brilliantly than the other. This produces an effect of roundness in the subject, which is called modeling and which is one of the most important means at our disposal to make our subjects

more lifelike. When one gives a little attention to it, it will not be found difficult to arrange the subject with respect to the light and the camera, so that it is illuminated more brightly from one side than from the other.

This method of lighting would, at first, appear to give uneven exposure since, if one side of the subject's face is in bright sunlight and the other in deep shadow, perhaps the two extremes will fall outside the exposure range of the film. This is, indeed, a possibility, providing the shadow side of the subject is concealed from the general light of the sky, as when taking pictures under a porch roof, indoors near a window, or in similar situations. But, under the average open conditions of daylight, it will be found that the general diffused light of the sky will lighten up the shadow side of the subject fairly well and that the exposure flexibility of the film will be sufficient to meet the condition fully. The exposure on such a subject should be in the nature of a compromise between its darker and its lighter phases with a tendency to favor the darker side. An exposure meter will be a very valuable guide under these more advanced conditions of lighting.

When making pictures of an important single subject, the photographer should watch out for his background. Side lighting, as described, will help to "snap the subject up" but, in addition, a background should be chosen which is not too "busy." A dark, neutral background is preferable for most subjects that are well lighted; if the background contains moving objects or some striking pattern, this will detract attention from the subject, even if the background be out of focus. Backgrounds are important things when single objects are to be photographed.

Noting the possibilities of partial side lighting in making the subject stand out from its background, it seems logical to carry the idea somewhat further and to illuminate the subject fully from the side by means of a very brilliant light, so that the comparison between this brilliant "rim"

light and the rest of the subject will outline it in the strongest possible way. In considering this style of lighting, we must remember that most of the surface of the subject which faces the camera will be in shadow and must compensate for this by opening the diaphragm wider. When the subject is so placed that the lighting is fully from the side, there begins to occur the danger that stray beams from the source of illumination will touch the glass of the lens and cause a flare. As in indoor lighting, this must be carefully guarded against and, in most cases, may easily be prevented by the use of a small, opaque body held at the side of the lens barrel between it and the offending source of light. This extra precaution in many cases is well worth the trouble, as rim lighting often produces very beautiful effects.

The *ne plus ultra* of rim lighting is found in the full backlighting effect often used in professional pictures where the light is fully controllable, but this is tricky for the amateur out of doors, unless he has fully absorbed the preceding precaution. For backlighting consists in arranging the subject so that the full sunlight falls on that part of it that is turned away from the camera. The "spilling" of this light around the edges of the subject often produces a very beautiful outlining effect, particularly if the subject has fluffy hair which the light glorifies into a halo. But the chief difficulty here is to prevent the light from shining directly into the lens too, as this occurrence would cause such a bad flare as to tend to make the picture impossible. Various expedients for preventing this have to be adopted, one of the simplest of which is to allow the shadow of the subject, itself, to shield the lens. This may be done if the sun is low or if the camera is placed low down, pointing upwards. The main thing in all of these special lightings is to keep the light from striking the lens. Where the subject is fully in shadow, the diaphragm will have to be opened wide to compensate.

Reflectors

The use of lightings in which part or all of the subject is in shadow may be greatly facilitated by the use of a good reflector. This is merely a fairly large, flat surface of high light reflecting power, which is so placed with respect to the subject that it will turn back the light which falls upon it to illuminate the shadow area. In fact, so effective is the use of a reflector for portrait closeups and the like, that the amateur who has used one will wonder how he ever got along without it. Reflectors may be stiff, white cardboard, wall board, sheeting or, in fact, any substance which is flat and will reflect light. The most effective reflector for all around purposes has a matte surface which diffuses and softens the light; this is known as a "soft" reflector. A "hard" reflector is a surface which is of a metallic nature, so that the light it reflects is more like that of a glass mirror. The latter type of surface should be used in sunlight with great care, as it tends to give a confusing, uneven effect.

There seems to be no end to the ingenuity of amateurs in improvising handy forms of these reflectors. An ordinary white roller shade mounted on a flat board and weighted at one end, so that it may be rolled up or down at will, is one of the most convenient forms. A reflector that will support itself by means of a stick thrust into the ground is very handy; two reflectors have been hinged together like the leaves of a book, so that they will stand unsupported.

Lens shades

The use of side lighting of all kinds calls to mind the necessity for being very much on the alert to protect the lens itself from stray, direct rays of light. An automatic means of doing this is found in the *lens hood* which is nothing more nor less than some kind of a tube, blackened on the inside, placed around the lens barrel and extending

well in advance of the front element of the lens itself. Such a tube may be improvised from an ordinary cardboard mailing tube about two inches in diameter and projecting in front of the lens about four inches. The tube must not be too long, else it will cut off corners from the lens field. An improvised lens hood may easily be made by wrapping a piece of black paper into the form of a cone, with the lens pointing through the small end. Even where the direct rays of light do not reach the lens, if the atmosphere is very brilliant or if the surroundings are highly light reflecting in quality, the use of a lens hood will help to give a much clearer picture. Such a case would be found in sunlit snow scenes or on the beach or desert.

Using filters for varied effects

We have touched previously on the use of filters and have promised the reader more about these aids. Their function has already been outlined but it will be taken up in more extended form here. For all outdoor views in sunlight, except where extreme closeups are involved, the use of a filter is indicated. Two yellow filters, the 2X and the 4X, are very useful for all around work and, in certain cases, two such filters may be had combined in a single sliding mount, so that either may be used at will. Filters may be had in the form of circular caps which fit over the barrels of specific lenses or in square or oblong glass forms which slide in mounts that clip over the lens barrel. They may, of course, be secured in any specific density from one and a half times up; the deeper the color of the filter, the more pronounced is its effect. The *graduated filter* is one in which the density varies from clear glass at one end to 4X or 5X at the other, so that, by sliding the filter in its mount in front of the lens, various densities may be used at will. Since the filter holds back some of the light from the film, the exposure must be

increased by opening the diaphragm to an extent indicated by the factor of the filter. It must be remembered, in this connection, that this factor will vary with the kind of film used and that the factor of any given filter for all the various emulsions should be ascertained from the dealer or manufacturer when it is purchased.

Ordinary types of filters are colored yellow or amber, that is, they appear to be of this color to the eye, because they hold back some of the blue light which affects the film powerfully. Filters for special effects often have very deep colors and may differ radically from ordinary filters in appearance. The special effects for which these filters are to be used lie well within the advanced field of the amateur. These dense filters give a very drastic *over correction*; that is, they hold a certain kind of light back to such an extent that its absence is very noticeable in the picture. The most used of these special filters is the deep red, or "A" filter, which is so dense that it holds back the color, blue, completely. For this reason, landscapes and similar subjects will appear on the film with a very dark sky when taken through the deep red filter. It is thus used to give so called "moonlight" or "night" effects to pictures taken in the daytime. If there are any clouds in the sky, these will appear sharply outlined against the dark background with this filter. This effect, of course, is grossly exaggerated and should be used with discrimination. There is an even denser red filter than the "A", which is called the "F". This is so dense, however, as to be capable of use only on very rare occasions. The factor of the "A" or similar red filter may be taken as approximately 8X to 10X with panchromatic and 5X with super panchromatic film. The factor of the "F" filter is approximately 12X with panchromatic and 8X with super panchromatic. There are other special filters beside these but, since their use is very rare among amateurs, they will not be discussed here.

A filter especially adapted to use with super panchromatic film is the green filter, which is comparatively of recent appearance. Such a filter holds back some of the blue as well as some of the red in the scene, allowing the weakest colors, green and yellow, a chance to register more favorably on the film. The green filter is best used only with super panchromatic film and should be restricted to use with scenes such as summer landscapes or those which contain a preponderance of green.

Although we have already discussed the fact that the factors of filters vary with the film used, it is a point of sufficient importance to emphasize again here. The two most used emulsions in the hands of the amateur are panchromatic and supersensitive panchromatic, or super panchromatic, reversible film. With almost any given filter, its factor with supersensitive is very much less than its factor with ordinary "pan" (slang for panchromatic). It will be seen that, in this way, the factor of the "A" filter is altered from 8 to 10X with ordinary "pan" to 5X with superspeed "pan"; comparable differences exist with the lighter filters in the same way. For ordinary 2X and 3X filters (with panchromatic film) no correction at all needs be made when using these same filters with supersensitive reversal film. Indeed, this type of emulsion may be said to be "self filtering," in that it reproduces more nearly in black and white the appearance of colors as the eye sees them.

While on the subject of outdoor filming, our comparison between ordinary panchromatic and supersensitive panchromatic again emphasizes the important point, already noted, as to the actual comparison of speed between these two films. Supersensitive is the faster of the two, so that, when using an exposure based on the use of ordinary panchromatic film for any given scene, the lens should be closed down one stop over this estimate when using superspeed. All of the exposure estimates given in this and other chapters (except when specifically stated otherwise)

refer to the use of ordinary panchromatic film; if super-speed film is to be used under these same conditions, the lens should be closed down one stop. It sometimes happens that, under very brilliant conditions, the smallest stop which the lens possesses is indicated with ordinary panchromatic film. Under such daylight conditions, if super-speed film is used, the picture will be overexposed unless a fairly dense filter, appropriate to the conditions, is used to hold back a little more of the light. Sometimes a higher camera speed than normal can be used to produce the same effect.

Slow motion

The use of the higher camera speed than normal, mentioned in the previous paragraph, leads us directly to a discussion of the slow motion effect. Normal camera speed is 16 frames a second; if the film is taken and projected at this speed, the action will seem natural on the screen. However, if we take the picture at a rate higher than 16 frames a second, as 32 or 48 or even higher, we shall see at once that there will be a greater number of frames recorded of an action in any given duration of time. If we take this finished film and project it as before at 16 frames a second, it will take a longer time for the action to be unfolded on the screen and the action will, therefore, seem slowed up. If the film is taken at 32 frames a second and projected at 16, it will seem twice as slow, if taken at 48 frames a second, three times as slow and, at 64, four times slower. While scenes taken at high camera speed are "film eaters," some very beautiful effects can be produced by the use of slow motion. Almost any natural, rhythmic, human or animal action looks well when analyzed on the screen by slow motion. Grateful subjects are divers, running horses, golfers, tennis players and similar participants.

The matter of exposure in slow motion is a most important one. Since the film travels more rapidly through the camera, each frame will receive less than the normal

exposure and the diaphragm must be opened up to compensate for this. Most cameras having slow motion attachments provide the user with a handy chart by means of which this may be done.

Tripods

Mention has already been made, in passing, of the tripod, that most useful of all camera accessories. A hand held camera may be gripped by an individual with nerves of iron and the picture taken in this way will yet reveal to the observing audience a movement of the entire picture on the screen, which may make itself felt almost subconsciously. On the other hand, if the same picture is taken with the camera on the tripod, the picture on the screen will be absolutely immovable and rock steady in its quality. Those amateurs who wish to add the final touch of perfection to their pictures should use a tripod whenever and wherever possible. Tripods are available made either of metal or of wood; each has its own devotees. But the main object is to provide a support for the camera that will not wobble in use; therefore, the observant purchaser of a tripod will be quick to note, on inspection, whether his prospective buy is staunch and well made in this respect. The use of a *pan and tilt head* (a device to enable the camera to be moved in a horizontal arc or vertical arc, as desired) on a tripod is very convenient in centering the subject in the view finder and in making angle shots of all kinds. The tripod will also aid materially in arranging horizon lines and other objects truly and squarely in the picture. Considered inspection of the view finder and appropriate arrangement of the camera with relation to the image wanted is greatly facilitated when the camera is on a tripod. Moreover, once having set up the camera and tripod in their proper positions, one need not fear shifting the point of view inadvertently, as might be the case with a hand held camera.

Distance meters

Those who wish to remain by the camera's side, both before and during shooting, may satisfy themselves as to the exact distance between the object and the camera by making use of one of the several optical instruments now available for the purpose. These are known as distance meters and measure distances just as accurately as exposure meters measure exposure. The distance meter is found in two general types, the *double image* or "triangulation" type and the *focusing* type. The former operates on the same principle as is used in sighting from two points and measuring distances in surveying. The instrument is generally held horizontally and, on inspection through the eyepiece, two images of the object are seen. Adjustment is then made by means of a knurled disc, to bring the two images together so that they will coincide in the field of the instrument. When this is done, the distance may be read off from the adjusting dial, where it is usually engraved. These meters are very simple to use and are especially accurate where accuracy is a necessity—on the closer distances. In using, one should be sure that the hand does not obscure one of the openings. The focusing type of distance meter depends upon the principle that a lens of wide aperture is very critical in focusing. Such meters consist of what is, in reality, a miniature camera containing such a lens, incorporated into a tube. The eye sees the lens image focused on a miniature screen; this image is usually magnified for finer focusing. The lens is always used wide open—it has no diaphragm—and the object is simply focused through this lens. When it appears sharp on the screen of the instrument, the distance is simply read off from the focusing lens scale. This, it will be seen, is simply a reverse procedure to that used in focusing the camera taking lens, where the image cannot be seen. Here, again, the meter is especially accurate on the important, closer distances. Either type of meter may be used to advantage and the result of this use will be ap-

parent in better pictures. An interesting application of the focusing type of distance meters applied directly to the taking lens is in the *focusing magnifier*. This is really a focusing distance meter, as previously described, but *minus* the lens. It is so arranged that the camera lens may be removed and placed in the tube of this device, so that the lens image may be seen and focused visually. If held near the camera when so focused, it may, after this operation, be replaced in the camera mount with the confidence that the film image will be satisfactorily sharp.

Filming at half speed

It has already been noted that the use of a film speed of eight frames a second, while the film travels through the camera, will increase the exposure. The reason for this is very easy to see; if the film travels more slowly, each frame will be exposed longer. This attachment is very valuable to the cameraman when he is confronted with lighting conditions of such a nature that the fastest speed of his lens is not quite sufficient to produce a fully exposed image. Under such conditions, one may assume that his lens is made one stop faster by the use of half speed. Since fewer frames for a given unit of duration of action are recorded by the use of half speed, if the resulting film is projected at the normal sixteen frames a second, the action on the screen will seem unnaturally fast. This fact may be used to advantage to produce comedy effects, but, in "straight" shots that are not intended to be laughable, care must be exercised to see that the subject moves twice as slowly as normal when filming is done at half speed. For this reason, half speed is best suited to landscape and similar shots where human activity is not present. An excellent, legitimate use of half speed is found in the cine photography of landscapes which contain slowly moving clouds in the sky. The effect at half speed will be to render the cloud motion more perceptible and to make the scene more lively. Especial care must be exercised when the camera is hand held and operating at half speed.

Kodacolor

To conclude our discussion of outdoor filming, there is presented the matter of cine photography in natural color. At the time of this writing, the process most widely used by movie amateurs for this purpose is *Kodacolor*. The inner workings of this process are rather complicated and will not be discussed here for the reason that, in actual manipulation, the process is almost as simple as that involved in taking pictures in black and white. For Kodacolor filming, it is necessary to possess a fast lens to which a three color filter is adapted. The only way to take pictures properly is to make use of a lens especially adapted to the process, since the position of the filter mount, with respect to the lens, is very important. With the new supersensitive Kodacolor film, one may take color pictures in bright shade, in the open under cloudy bright conditions and, of course, in brilliant sunlight. The lens diaphragm is locked open at its widest point and should not be altered in any way by its user. For regulating the amount of light that falls on the film, the *neutral density filters* (cutting down light for all colors equally) are used and, for exposure suggestions, the following table may be useful:

Light	Stop that would be used when using black and white film (normal panchromatic)	Camera Speed	Neutral Density Filters
Dull or open shade	f/4.5 to f/5.6	1/2	none
Slightly cloudy	f/5.6 to f/8	normal	none
Normal sunlight (direct)	f/8 to f/11	normal	No. 1
Brilliant sunlight	f/11 to f/16	normal	No. 2

For best color values on the screen, the subjects in the picture should be in as little shadow as possible, so that extreme side and backlighting should be used very sparingly with this process. Make sure that the Kodacolor filter is placed in its correct position on the lens barrel. In most cases, this is provided for automatically, but one must remember that the color bands of the filter should be absolutely vertical. They may readily be checked with the straight, vertical side of the camera. Looking at the filter from the front, the correct order of the colors from left to right is red, green and blue. Make sure that the *ratio diaphragm*, or small metal cap for the inside of the filter, is attached. It is important to use the ratio cap which came with the particular roll of film being used. Full directions are packed with every roll of film. In this way, only, can the proper results be secured.

Be sure that the lens and the Kodacolor filter are clean, as dust may cause a variation in color values. The best means of cleaning the filter is to use the lens cleaning tissue that can readily be got in book form. Be sure that direct rays of the sun do not fall on the filter at any time. It is provided with a sunshade to help guard against this but, under certain conditions, danger may arise. As is true for all filters, the heat of the sun falling on one of these, when it is not in the camera, may cause serious damage. Therefore, when a filter is not in use, it should be kept in its case.

Another color process that has recently been presented is the *Morgana*, which is a two color additive process. Whereas, with Kodacolor, the color mechanism is provided by detachable filters that may be added to cameras and projectors at will, with *Morgana*, the mechanism is built into camera and projector, the filters being a part of them. With Kodacolor, special film is used for color photography; with *Morgana*, regular panchromatic reversal film is employed. *Morgana* does not parallel the advantages of the three color Kodacolor but it has certain distinguishing fea-

tures; duplicates may be made, just as from black and white reversal; any lens may be used; pictures may be taken under more adverse light conditions, as the process calls for opening the lens one stop more to allow for two color filters; screen pictures of large size may be shown.

What shall we film?

Continuity Up to this point, the word *continuity* has been intentionally avoided because it is an expression that has been frequently misunderstood. Many new amateur movie makers think that it refers to professional film production and believe that it implies some kind of written scenario. This is not the case, for, without using the word itself, we have been discussing continuity steadily from the first chapter forward. The idea for the film, *Junior at the Beach*, is a continuity, as are all the other themes for pictures that have been introduced from time to time. The word "continuity" is merely a convenient designation for a film's theme or connecting thread. It refers to the mechanism of presenting a series of scenes so that they will have coherent and continuous relationship. Any idea that achieves this may be called a continuity and the technique of continuity is merely to do the job well, that is, to make a really entertaining picture. In the remaining chapters of this book, the word "continuity" will be used as a brief and convenient synonym for connecting threads of interest in films.

The family

Very probably the amateur movie camera has no more important use than in making permanent living records of members of the family, those very near and very dear to the movie maker. The most highly valued possessions of many a cameraman are his reels of the children and of his parents. Since subjects of such films are very close at hand

and since the amateur movie maker feels that he can at any time get shots of them, he fails to plan these films, missing some of the most delightful picture achievements that he could secure.

There is an enormous number of possible themes and *motifs* that add greatly to the interest and audience satisfaction of such pictures. A very simple theme of this type was presented in the discussion of *Junior at the Beach*. Circumstances, the settings and backgrounds available for action, the taste of the individual filmer, the interests of members of the family themselves and a thousand other things govern the treatment and ideas that may be used as a basis for a family picture. The very important thing is to avoid lengthy series of "pot shots," films made here and there and at any time. If one falls into the trap of taking this kind of pictures, it is inevitable that they will, instead of being popular and interesting films, as they should, be relegated to the shelf, while the pictures that have been made with care will monopolize the projector. Family pictures are certainly worth taking and they are certainly worth taking carefully—just as carefully in the field of arranging subject matter as in that of photography.

Many beginning amateurs film records of their children, starting, sometimes, with the moments just after the birth of the youngster, followed by sequences of his first bath, his first ride in the open, his first steps and continuing until he is a sturdy little fellow of six or seven. Well titled and carefully edited, such films are important family documents and are certainly worth the trouble put upon them. On the other hand, there can be no doubt about their limited appeal for projection in an evening's entertainment. They are properly family records.

Better from the viewpoint of entertainment would be a film based upon a day in the life of the family. Such a picture could begin with the children getting up in the morning, followed by scenes of them dressing and, perhaps, of the

father shaving. Then would come breakfast and the departure for school and office. There might be sequences of the younger children playing in the yard, followed by luncheon and, afterward, the arrival of the other children from school. A sequence of the father of the family greeting them on his return from his work would make a pleasant ending. It will be seen that this scheme is based upon the simple following of a natural chain of events. Other natural sequences of events may equally well be used for family films. For example, there is the Sunday motor trip which could start with the children piling into the back seat, followed by views along the road, shots of a picnic lunch and ending with a sequence of the homeward journey.

Birthday parties will make excellent subjects and it is easy to work out little stories that will delight the children and amuse the grownups. A film of a birthday party might run about this way: 1. Near view of Billy, nine today. Title: *Billy reaches his ninth year.* 2. Another near view of Billy. 3. Closeup of Billy. 4. Closeup of a birthday cake with nine candles. 5. Several different shots of youngsters arriving at the birthday party. 6. Billy unwrapping presents. 7. Games being played by the children (several scenes might be used here). 8. Closeup of a large dish of ice cream. 9. Medium view of the children running toward the tables on the lawn. 10. The children are seated eating the refreshments. 11. Closeup of the birthday cake with the candles lighted. 12. A near view of Billy as he blows them out. 13. A general shot of the children at the tables. In this skeleton outline, closeups play a very large part. Closeups of the ice cream and of the cake will tell the story as will nothing else. It is easy to get pleasant lighting effects and a very beautiful screen image in such shots.

With the aid of interior lighting, indoor sequences are possible and they provide the best opportunities for pleasant film stories of members of the family. The kitchen has many possibilities as a background. The preparation of a meal is

an ideal occasion to get unposed and natural shots of Mother, interspersed with unusual closeups of the kitchen utensils in use—and some of these will give delightful camera subjects, as, for example, a whirling egg beater. The children taking their baths and listening to bed time stories and then preparing for bed can be handled in the same way. One movie maker made a first class reel, called *An Evening at Home*. It began with closeups of hands washing the dishes, then came a longer view of the kitchen that showed Mother washing and Father drying the dishes. After this came scenes of the family about the fireplace, sprinkled with closeups of each member of the family, some reading, others listening to the radio, Father smoking. It ended, of course, with the family marching off to bed, first the children and then the grownups, finally concluding with the lights being turned out.

Out of doors, very satisfying films can be made of holiday outings, picnics, swimming, boating, motoring and all kinds of games and activities. The important consideration is to have some advance plan for the filming. A casual analysis of the features of the event, whatever it is, will almost always suggest some idea on which to assemble the picture. A holiday afternoon may provide an opportunity to make a film of Jerry's adventures with the dog or it may be the story of a ride through the park.

To get a good, informal family picture it is necessary to be sure of three things: 1. the idea of the picture must be established, that is, if we are going somewhere, the audience will have to be told where we are going and the opening sequence must establish the background of the situation, whatever it is to be; 2. the story must have development, progressing in some way toward the logical end; 3. the picture must have a specific climax so that it will not end "up in the air" but will definitely conclude. In the picture of Jerry's ramble with the dog, for instance, the film might end with Jerry feeding his pet, back home again. These consid-

erations do not apply to family films alone and criticism, from this viewpoint, is a useful guide to making better and more entertaining pictures.

The simple dramatic picture or photoplay is a most attractive possibility for children. Simple plots may be culled from sources like the comic sections of newspapers and can very easily be turned into film stories. The dramatic picture will be discussed more fully in Chapter IV.

Travel films

The satisfaction of permanently capturing the beauty and interest of strange places on film for later pleasure is one of the important advantages of owning an amateur movie camera. Not only may one make fleeting impressions of foreign countries permanent on celluloid, but one can also present these scenes through one's own viewpoint. We can select and reject, taking home with us what we consider the most valuable and, in screening the picture for friends, we can relive our experiences again and can present them to our friends through our own eyes.

Many amateur movie makers use the itinerary of their trips as the continuity theme for foreign travel pictures. The film starts with the party boarding the boat and these scenes are followed by shots of the boat and of the harbor as the ship leaves the dock. After these come sequences of deck sports, life on the boat and marine views and then we see the landing of the ship and there follows a straightforward presentation of the countries and places visited in the order in which the trip is made. Such a travel diary continuity has the advantage of preserving the record of the trip, just as it was accomplished, but its greatest drawback is the fact that so many other amateurs use exactly the same treatment. Therefore the idea has been dubbed the "from here to there" continuity and any audience that has seen it once knows roughly what is coming. Indeed, an experienced

viewer of a great many amateur travel films can predict the advance footage almost better than the maker of the film himself. The best way to avoid the danger of making your travel film just like everyone else's, if you must follow this continuity, is not to emphasize the route and the connecting incidents, such as boarding boats and trains. It is better to leave these out and to make jumps from one place to another by means of titles. Some amateur travel filmers have made use of animated maps, showing exactly the route of the journey. This is a positive nuisance to those in the audience who know their geography and it has the additional disadvantage of informing the spectators of precisely what is to be seen in the rest of the reels. It emphasizes the route too much at the expense of the really interesting things for which the traveler took to the route originally. If the continuity of a travel film is based on following the itinerary, it is best to bear down on the itinerary as little as possible. Make individual pictures of each important point of interest and tie them together with titles.

For the amateur who wants a different approach, there is a multitude of enticing themes. Many of these are based upon the fundamental idea of contrast and comparison. In travel through strange countries, one unconsciously compares a given situation or circumstance in one country with the parallel in another. How often does the traveler mentally measure a foreign meal with the home product! When he sees the strange costumes of Albanian peasants and the yardage used in the skirts of the men, he thinks of the fashionable dress of Parisian ladies, with the yardage reduced to inches. When he sees women toiling in the fields, he immediately thinks of the life of his own womenfolk. In the last analysis, most conversations about travel in foreign lands boil down to a discussion of contrasts and comparisons.

The idea is little exploited in the field of amateur films, however, and the amateur who makes a good film based on contrast and comparison as a continuity *motif* will find that

he has a distinctive picture. It is possible to tackle the idea from a general viewpoint and to emphasize the contrasts by titles. It is, perhaps, a more workable plan to select some particular theme for a given picture. We could compare the costumes of the countries visited and even be more specific and contrast footwear and headgear. One amateur made a fine film called, *It Gets There Just the Same*. The reel presented transportation facilities in some of the most interesting spots of the world. The vehicles of New York's Broadway preceded shots of Paris traffic, which was compared to the strange carts on the roads of China and Japan. At the conclusion of the picture were scenes of foot traffic in India and, at the very end, the picture returned to the homeland to show an airplane taking off at a modern flying field.

Another movie maker of distinction chose water as his theme for a travel film that carried one around the world and ended in his own living room. A third film was called *Mother Checks Up* and presented the wife of the cameraman visiting the typical markets and shops of the world. Sports and recreations is another subject that can be similarly treated. The walking tours of the Germans can be compared to the race tracks of the English, the bullfights of Spain, the *jai alai* of Havana, the cockfights of the Orient. Social habits, tastes for food, customs of all kinds and even industries and shipping may be used for travel picture themes.

A study of a single country may serve as an excellent continuity, if the amateur is to be in one place long enough to permit gathering suitable scenes. Burton Holmes has demonstrated the value of this leisurely approach in his excellent travel films. Recently, professional short subjects of travel have adopted the same method and there are several regular series of pictures on different foreign lands.

Of course, a special individual interest immediately suggests a very good travel continuity. An architect will bring back with him an architectural study of the countries that

he has visited; a sportsman will emphasize the sports of his national hosts, while one who is interested in the history of a particular period may almost recreate that period by carefully selecting viewpoints for his scenes. A Dickens London is still possible for the amateur who is willing to look for the right subjects and a *cinquecento* Italy is very easy to reproduce. Of course, care must be exercised to get viewpoints that eliminate modern elements.

Composition (the arrangement of masses in any given scene) is important in travel films because the emphasis of the scene is so very often in its beauty. Avoid bisecting the view with the horizon in scenic shots. The straight line across the center of the picture makes an unpleasant division. Look for advantageous viewpoints in making scenes of buildings and statuary, planning the camera position so that there will be a nice balance of light and shade. Frequently good *camera angles* (camera positions with reference to the subject, other than those involving distance alone) are to be found where one would least expect them. A good idea is to buy the picture postcards that are offered for sale on the streets, for they will suggest angles and advantageous viewpoints that have been worked out by local photographers who have had plenty of time to choose the best. This method of getting the most suitable camera viewpoints is recommended by one of the most able of travel photographers.

Be sure to get a sequence of important subjects. Don't let the scene go with just one shot, but first establish the subject, building, market or monument, in a fairly long shot. Then come close to show it nearer to the camera or to point out some detail of it, perhaps taking another closeup and ending with a shot from a different angle. One is often tempted to take too little footage of a given subject. Almost every returning amateur says of some scene, "I didn't get enough of that." Not infrequently, traveling companions drag the insistent movie maker away. This brings up a point that is well advised. If one is traveling with friends, it is

probably best to assign some particular time of the day to do the filming. Go alone with your camera and revisit, if possible, places already seen in the company of others. Then, in glorious, undisturbed solitude, make your movies.

Since new views are constantly being presented to the travel filmer, there is always a temptation to make too many and too fast panoramas. The same advice holds good here that was earlier offered. Every time that a panorama seems indicated, stop and consider if the picture could not better be presented by two or three separate shots. It rarely takes more footage, and many subjects, such as buildings and monuments, are not suited to panoramas. It looks a little strange to see them sailing drunkenly across the screen instead of reposing in their accustomed stately grandeur. The same point applies to *tilting* (moving the camera upward and downward vertically, on a pivot) but with less force. It is often desirable to show the height of some structure by following the eye upward with the camera but such tilts should be steady and even.

Not infrequently, subjects of travel scenes are entirely static and more interest can be given by the addition of some motion. A member of the party walking past the camera may provide the necessary action to make the scene lifelike, but beware of his staring into the camera lens. It is better to have no motion at all in the scene than to have a selfconscious traveling companion—and Aunt Jennie is almost invariably selfconscious when confronted by the Sphinx or the Colleone—eyeing the lens suspiciously. She will destroy the grandeur of the Colosseum or mar the beauty of the Duomo. Local inhabitants, less awed by their surroundings, will give the needed motion more happily.

Scenic films

The amateur scenic film is almost invariably a scenic film and something else in addition. Scenery plus a hike

may be the *motif*, scenery plus an automobile trip or scenery and a horseback ride. The extra something, whatever it may be, usually suggests a very good continuity for the picture. A story of a day's walking in the woods may include many glorious scenic shots. These can be worked into a perfect continuity by careful editing. We see the hiker start his ramble through the woods and we follow him as he clammers over rocks, crosses bridle paths and wades streams. Occasionally he will sit down to rest or smoke and, as he looks off into the distance, we can cut in selected beautiful views purporting to show what he sees. Then would come a shot of the subject finishing his rest and getting up to wander on. This idea has been exceptionally treated in a scenic film of Sequoias in California and Yosemite National Park. Views of the hiker walking through the trees were spliced in with shots of what he saw. The camera took his viewpoint every so often and presented the beauty of the place as he would see it. Then it came back again and showed the hiker strolling on. The picture was not made in one single day's ramble, for places many miles apart were included. It was a composite film of many days' wanderings, from which the best had been taken to make an ideal, although impossible, hike. It happened that this particular amateur film was made on 35mm. stock and it was so exquisitely handled that, although made for the amateur's own pleasure, it was quickly purchased by professionals.

Riding, fishing, hunting, a camping trip, in fact, any outdoor exercise that takes one over the countryside could be handled in this way. Many of the best hunting films are really scenic pictures for which the hunting furnishes the excitement and dramatic activity but the backbone of which comes from the beautiful scenery.

The Simon pure scenic, the beauty of nature itself, has a definite place, however. Several years ago an amateur movie maker led off films of this type with a study of

the moods of the sea. The sea was the feature of the picture and, at the same time, its only actor. The ocean, calm and quiet, was contrasted with the coming of a storm, the enlivening surf and, finally, the angry seas. This picture was followed by another similar study of winter, in which the moods of the snowy season were presented. Of the same type is another amateur picture which utilized the growth of a stream, from a tiny spring to a great river, as its continuity. Actually, many different streams and rivers were used to furnish material, but the picture was very successfully edited to give the impression of a continuous development.

The Kodacolor filmer may take flowers as his *motif* but he would get even more magnificent results with some theme such as autumn or spring. Cloud formations and the history of rain have been used as scenic *motifs*. The weird and very beautiful patterns of frost and dew may supply a continuity for a shorter picture. One able movie maker has filmed a scenic almost entirely in closeup, his desire being to isolate the truly significant forms and impressions of motion in nature and to emphasize them by the enlargement secured from closeups. The animals in the meadow, the daily work of the farm, the wild animals of the forests, all can furnish continuity *motifs* that will make a satisfying scenic picture. There is no field of filming in which opportunities are so various.

Vacation films

Many movie makers take their best films on vacations, for the holiday spirit enters filming and a fresh viewpoint on life in general brings with it a fresh approach to movie making. Although some amateurs seize the occasion offered by a vacation to make a film on some special topic that they have been eager to make for some months and even alter their vacation plans to suit the demands of this film, most movie cameramen use their equipment as a happy

method of preserving the memory of a very good time. In casting about for a continuity theme, the "from here to there" treatment crops uppermost. It is logical and simple, calling for little extra effort, but its disadvantages have already been mentioned. There is always the danger that too much emphasis will be given to the purely connecting elements, catching trains, boats and buses, starting and stopping the car and other unimportant things. On the other hand, one can escape this by emphasizing deliberately the modes of travel; some of the best vacation pictures have been really film studies of trains and boats. When one emphasizes them to this extent and prepares an interesting plan, which includes closeups of mechanisms and unusual viewpoints, the objection disappears entirely. Very exciting sequences of trains may be made, for instance. One may start with a shot of the train at the station and follow it with a closeup of the whistle as steam pours out when it is blown. Next could come a closeup of the driver and the wheels of the engine starting to move and, finally, a full shot of the train as it starts to rumble out of the station. These scenes would all be got some afternoon at the station and might be made of any passenger train. Then the shots could later be spliced in at the beginning of the travel film and the effect on the screen would be exactly the same as if we had filmed our own train as it left the station. Inside the train, supersensitive film and a fast lens will allow taking a shot of your wife as she looks out of the window. This could be followed by a shot of the landscape taken through an open window as the scene rushes past. To avoid the unpleasant effect of objects flashing by at right angles, the camera could be held at an oblique angle to the train's motion. It would, perhaps, be possible to catch the front of the train as it goes around a bend in the track, a magnificent shot, particularly in steep and mountainous country. Then the camera may be taken to the back platform where it will be very easy to get portrait shots of members of the

party as they look at the scenery. The camera may be held upside down and reverse motion shots made of the track as it dwindles into the distance. When spliced in correctly, the shot will look as if it had been made from the front of the engine. One may even film in the dining car; indeed, some lovely studies have been made there.

A boat is equally fascinating in film. Beautiful compositions may be secured on the decks, employing the ventilators as frames. Interesting shots of the bow cleaving the water or the churning wake at the stern can be made. If the ship's telegraph is accessible, closeups of it, spliced in to show the signals as the boat maneuvers, would make a splendid sequence. Port holes frame shots of other ships passing, very effectively, and, in the larger steamers that are now available for even short holidays due to the innovation of very short cruises, it is possible to get interior shots of saloons and game rooms.

Some vacations will be spent in the south during the winter time and this suggests a theme of comparison between the northern winter and the southern summery weather. Such a film could start with the family at home, wading through the snow and slush toward the taxi or station. There would follow the transference of the scene to Bermuda or Miami and the outdoor sports. From time to time, scenes of the northern winter could be inserted to point the contrast.

When a vacation becomes a hunting or camping trip, the film will naturally feature it. A very good device to add interest to such subjects is to build up the anticipation of the audience for what is going to happen. Show the hunter in his study cleaning his guns, overhauling his kit and generally making ready. There might be a closeup of him looking at the calendar on which is plainly marked the red letter day that begins the vacation. The scene might shift abruptly from him, dressed in street clothing, looking at the calendar, to a scene of him dressed in hunting

clothes, with a gun in his arm, standing in front of the cabin or tent. The transference of thought will be obvious and we shall have understandably shifted our subject to the important part, without wasting footage on the more humdrum elements of the trip to the camp.

To get the keen anticipation of vacation into a film of it is very important. In films of vacations mainly devoted to travel, this may be accomplished by showing the prospective vacationists studying over the enticing travel folders. Footage spent in building up the feeling of anticipation is never wasted because, if you can transfer that feeling to your audience, you will have given them half of the pleasure of your vacation.

Sport films

Advance planning of sport films may seem, at first glance, a bit useless because of the natural uncertainty as to exactly what plays will occur in any particular game. While it is obviously true that one cannot predict exactly what the action will be, it is possible to work out a general scheme and to adhere to it. A sport film may be a straight presentation of a game or, perhaps, a study of one particular player. If it is to be of the former type, the task is to select the elements of the game or activity that will make the most interesting film while, with the latter, the problem is even easier.

Slow motion, possible with several cameras, gives a very useful added facility in making sport films. It permits an exact analysis of a player's golf stroke or tennis service, when filming an individual, and it makes easy an understandable rendition of a fast football play in the game category. Closeups in sport films are just as important, if not more so, than closeups in other films. The action of the game or the fact that the cameraman is necessarily a fair distance from it and often restricted to a seat or fixed place usually makes it impracticable for the camera-

man to move freely as he does in other filming. The telephoto lens solves this problem admirably. Broadly speaking, slow motion and a telephoto lens are the two most important extra camera facilities in sport filming and they enable the amateur movie maker to work out much more interesting continuities than would otherwise be possible.

A sport film may very naturally and easily follow the progress of the game. In a golf picture, the story might start with the player teeing up, next showing him driving; then would follow shots of him playing in the fairway and next on the green. It would be too lengthy to handle all nine or eighteen holes in this fashion, of course, and so, very probably, the cameraman would bridge a lengthy gap with a title and would follow with scenes somewhere in the middle of the course, ending the picture with another title and a sequence at the last hole. In sport filming, deciding what to exclude is nearly as important as determining what to include. Almost all of the action is very attractive and there is always the fear that something important will be missed. An understanding of the game naturally helps in selecting the most significant shots.

Tennis, as well as golf, usually permits the cameraman to get quite close to the players, and therefore, to choose the most suitable camera viewpoint without hindrance. Most films of tennis, nevertheless, are made all from the same angle—a view of the players from the side. Much more interesting viewpoints can be taken by standing at one end of the court and filming the player at the other end. A specific sequence can be “faked” by filming a service from the other end of the court and then walking around and taking the other player as he returns a service. He is, of course, not playing the same one, but it will appear as if he were in the film.

Football is, perhaps, the most popular of amateur film sport subjects. To make a really entertaining picture, it is important to get the atmosphere of the game. Introductory

shots of the crowds pouring into the grandstand, the refreshment vendors and the cheering sections will get the film audience into the spirit of the event. Then would come shots of the two teams on the field, preceded by titles or by closeups of college pennants to identify them. Next comes the kickoff. A closeup would be excellent, although almost impossible to make in a real game. It can be "faked" by taking a very near closeup of a kickoff performed by Junior on the front lawn, before or after the game. A closeup of a pistol fired to signal the end of a period can even more neatly be "faked" and spliced in where needed. Take most of the plays in the first half of the game, since the light is often poor toward the end. Starting the camera early in making a scene of each play, to get the preparatory action, makes that play more understandable. Slow motion shots will help greatly, of course. Be sure to get the kickoff, a pass, a punt and, at least, one touchdown. Closeups of the score board can be used for the titles during the progress of the game and the final score may be given either by a closeup of the board or by one of a headline from the sport section of a newspaper.

In filming swimming and diving, sequences are all important. A very smooth sequence of diving may be filmed by making a composite series of scenes of several dives. Get a shot of the diver climbing to the board, a near view of him at the end of the board ready to dive, then a scene from the side as he dives, followed by a near view of the water as he lands, ending with a shot of him as he lifts himself up out of the tank or pool. By getting one person to make two or three dives, these scenes may easily be secured and spliced together to make a perfect picture, much more satisfying than the usual flash and splash.

Photoflood bulbs and supersensitive film mean that pictures of indoor sports are practical. Squash, handball and other court games are ideal subjects. Indoor track is a possibility and even basketball and indoor swimming events may be filmed.

Newsreels

Almost all amateur films are, in a certain sense, newsreels, but many amateurs make a particular type of picture modeled frankly on the professional newsreel. The principal difference in treatment between such newsreels and other films is that they are frankly a hodgepodge, but titled and edited, so that this jumble of events and subjects will not be unattractive. One of the most important points is to get complete sequences of every subject that will be included. Such sequences are almost complete, very short film stories in themselves. They must be able to stand alone. The other important consideration is the titles, which should be written in the style of newspaper headlines.

Several movie makers have made very amusing burlesque newsreels. The idea is very simple, being based upon the surprise element in humor. A title announces that Betty Tiptop has won the cup at the bathing beauty contest and this is followed by a scene of the wife presenting a dishpan to the cook.

Very important news "scoops" have been obtained by amateur cameramen alone and equally important news bits have been captured by amateurs as well as professionals. Such scenes deserve careful preservation, perhaps not in a typical newsreel but in a permanent historical collection titled and edited with more care.

Flavoring your films

Although an amateur movie maker's equipment may range from the minimum of camera, projector and screen to several cameras and projectors and almost all of the accessories on the market that do much to widen the scope of filming opportunities, the most important facilities in securing good continuity and making an entertaining picture for the screen are common to all cameras, whether

they are fixed focus $f/3.5$ machines or *turret mount*, multiple speed marvels. (A turret mount is a device for equipping a camera so that it will carry several lenses ready in mounts for immediate use.) All of these devices very clearly depend upon the way in which the camera is held or moved in the hands of the filmer and on this fact depends the very important question of whether the viewpoint will be one that yields a beautiful composition and makes a dramatic point in the film or whether it will give merely an undistinguished movie scene.

Movie makers have already been advised to hold their cameras steady and to select their viewpoints with care. The important step to follow is to become conscious of the multitude of viewpoints possible for any given scene. There can be no hard and fast rule for selecting the very best of these and, probably, no two expert cameramen would film the same scene from exactly the same angle. It means that the movie amateur must exercise his best judgment in selecting each camera angle and that, when this is done, the resulting composition, representing his best taste, will be his own artistic expression. Another movie maker might have chosen a different viewpoint but, then, he might have made a different film.

Camera angles

Although there are no hard and fast rules for the selection of camera viewpoints, there are certain considerations that can serve as guides to the filmer. First, a good camera viewpoint will achieve a good composition. The horizon will not bisect the picture, for this can be avoided by tilting the camera slightly downward or upward. The picture will not be flat and level, for a viewpoint will be chosen that includes a hill or tree or building that will break the level line. This will not be in the exact center of the viewfinder, but will be at one side. A viewpoint will be chosen to include foreground objects to give scale to distant

parts of the scene. If the amateur is careful of composition, many of the views will be pleasantly framed by trees, buildings, arches or doorways and the clouds in the sky will carry out the effect. A more detailed discussion of composition will be given later, in Chapter V.

A second factor governing the choice of a camera angle or viewpoint is the advisability of emphasizing the subject in some way or of bringing out some particular quality of it. Examples applicable to amateur filming may easily be seen in current photoplays. The upward angle on the heavy jowled villain emphasizes his villainy; an overhead angle of a group about a table emphasizes the connection between the persons and whatever is on the table; therefore, it would be an ideal viewpoint for the scene of a bridge game. A downward angle, as the heroine drops her handkerchief and the hero stoops to pick it up, catching her hand as he does so, emphasizes the significance of the act, presenting the scene from the viewpoint of the actors. This can be equally effective when Bobby is hunting a lost marble. An upward angle of a tall building or statue emphasizes its impressiveness and the same applies to steep cliffs or giant trees. A downward angle on a waterfall points out the distance that the water drops and the drama of its crashing below. An upward angle on a child's face, as he stoops to pick a flower, will bring out his intentness.

Another consideration in the choice of camera viewpoints is the avoidance of monotony. The beginner's natural instinct is to take almost every action from the eye level viewpoint. In the majority of cases, no better camera angle could be found, but occasionally it should be varied, if for no other reason than avoiding screen monotony. Variety can be given by taking general and very familiar views from angles other than those customarily used. For instance, upward angles of skyscrapers are common but downward pointing cameras are less usual. Eye level camera positions are customary in filming automobiles, trains and

boats, but it is not difficult to get a downward or upward angle in many cases. The start of a motor trip is usually filmed from the ground level but it would not be a great task to get an oblique angle by taking the scene from the second story of the house. Again, diving is usually filmed with an upward angle because of the elevated position of the diving board, but many pools offer a balcony from which eye level scenes could be secured. It would be possible to carry this effort to select new and different camera angles too far and a film might become forced and peculiar, as a result. However, it is always safe to pause before shooting and to ask oneself if there is a better or more unusual viewpoint from which the scene might be made.

The last factor in the choice of camera viewpoints is the consideration of the fact that the scene, when made, must fit with the other shots in the picture. For instance, a worm's eye view of the baby would not be effective, no matter how amusing it may be, if it were to precede a shot of the child riding in a car. It would need to be fitted into some sequence of the baby hunting an object on the ground or inspecting some little animal or flower.

It is important that the amateur should become conscious of the beauty and usefulness of well chosen angles and to be on the lookout for them in filming. It may be necessary for the movie maker to climb a ladder or to lie on his back on the lawn to get a shot that he wants, but an effective scene is worth the trouble.

Panoramas and tilts

Among the devices grouped under a discussion of the camera position is the pivoting of the camera known as a panorama. Almost every movie maker is tempted to make too many and too fast panoramas. The natural instinct is to move the camera in a sweeping circle as the human eye moves. But the human eye, without the consciousness of

its possessor, actually leaps from point to point. It is not minutely focused on every detail that passes before it in the sweep of a glance about the room. One can demonstrate that for himself by staring fixedly at everything that the eye encounters as the head is swung about in a semi-circle. Further, the camera is but a two dimensional medium and, consequently, a fast moving panoramic view tends to result in a blur.

Too frequent "panoraming" comes from desire to "get everything in." Very often the view could better be presented by a series of scenes than by a panorama. Nevertheless, the panorama is distinctly useful in amateur movie making; frequently it is the best possible way of translating into movies one's impression of a magnificent sweep of scenery or to carry the eye down a river. It is very useful in following action, a car driving alone, a member of the family walking down the street or the thrilling demonstrations at a *rodeo*. It is only a lack of analysis of the utility and limitations of the panorama that has thrown it into bad repute.

There are six fundamental rules to guide one in making good panoramas. The first is the common caution, *a panorama should be steady*. A vertical jiggle combined with the horizontal movement is bound to make an unpleasant screen effect. Second, *the panorama should be slow*. In concentrating upon getting the scene he wants, often the movie maker is not conscious that he is swinging his camera with a vertiginous speed, which will make a blur on the screen. A panorama is almost never too slow. Third, *avoid making a panorama of a series of vertical objects*. Try a short panorama of a picket fence and you will see why this is true. Fourth, *the motion of the camera should not describe too wide an arc*. An arc of about forty five degrees is about all that should be permitted the average panorama, for, if the swing is much longer and the panorama is made at the correct slow rate, the resulting scene

will be too long and dull on the screen. Fifth, *make the panorama from left to right*. This is the natural movement of the eyes in reading. Sixth, *never follow a panorama by swinging the camera back over the same scene*. This is probably the commonest and worst of panoramic faults. In the first motion of the camera, the scene has been revealed to the audience and the backward movement merely carries them over the same ground that they have seen, repeating the view to no purpose. Further, the quick reverse movement gives the picture a chaotic and jumpy effect. To make matters worse, in such cases, usually both movements of the camera are too fast and uneven and the net result is that, on the screen, the scene means nothing at all. If the footage wasted on reverse panoramas over the same subject could miraculously be added to the footage of the original, fifty per cent of the average movie maker's panoramas would be greatly improved. However, unfortunately, this cannot be done and film exposed in this manner is wasted so far as audience appreciation is concerned.

When the amateur has decided to use a panorama, the best results will be obtained *if the camera is "panoramed" from an object of lesser interest to an object of greater interest*. Thus, for example, if a panorama of hilly country were being made, it would be more effective to begin the swing with a view of the foothills and to end the sweep with the tallest and most impressive of the hills in sight. Similarly, if the subject were a city's skyline, it would be more effective to begin the swing with the lower buildings and to end with the larger and taller structures. The results will be even more effective *if, at the end of the panorama, the camera is held stationary for a moment and a foot or two of the scene is shot*. This furnishes a period for the scene and a pause which will make it possible to fit in better with other scenes in editing. It is also wise to start the panoramic scene by holding the camera stationary for a

few seconds before beginning the swing, but, of the two, it is more important to be certain that the panorama ends on a pause.

An ideal panorama would begin with a pause, as the subject of the picture was established. The camera would then be moved, slowly and steadily, coming to rest with a view of the most dramatic part of the subject. There it would rest for a few seconds before the camera was stopped. It is wise to guard against "panoraming" along the horizon, especially when it is broken by hills and trees, and a sky panorama is likely to be disappointing because the clouds present a continuous pattern without significance.

All of the points covered for the panorama apply equally well to the tilt, the movement of the camera either upward or downward, for a tilt is really a vertical panorama. It is especially important that the tilt come to a pause with a few seconds of the scene at the end and that it be made by moving the camera from a point of lesser to one of greater interest.

Writing titles

Titles are a very important factor in presenting an interesting screen story or even in making an understandable film. The amateur movie maker who does not use titles in his pictures is compelled to resort to verbal comments and explanations that detract from the audience's full enjoyment of his work. Of course, comments from the movie maker are usually not entirely out of place but, if every sequence requires a verbal explanation, the presentation of the picture is likely to become a monolog. Then, too, by not titling, the movie maker loses an opportunity for clever emphasis of certain scenes or the stimulation of the interest of the audience in others.

An analysis of the question, "why use titles?" easily illustrates their usefulness. The obvious answer is that the motion picture may be incomplete without them. When the

scene alone will not give a full understanding of the cameraman's meaning or does not include information necessary to an understanding of his purpose, then a title is indicated. If the idea behind the picture would be entirely clear to a stranger, a title is not needed. This frequently is not the case, because the motion picture, compelling and dramatic as it is, has specific limitations. The shadow images alone cannot convey definite ideas other than those represented in the scene. A closeup of Junior at his birthday party will not give his exact age. It would be difficult to do justice to a work of philosophy in movies, because movies cannot present abstract ideas; an argument of the philosophical distinction between right and wrong could not be filmed, although it might be symbolized excellently in a film play.

Granting the advantages of titles, as almost every one does, the problem of the amateur who has decided to title his first reels can be summed up in the question of where they will be useful in making his movie interesting and where they will be unnecessary. The choice of the words that he will use depends naturally upon where the title is to be placed. Placing titles is so interrelated with their wording that rules for the former also serve as guides to the latter.

One of the most important functions of amateur titles is to bridge gaps in the continuity or interest thread of the film. In a travel picture, for instance, an unexplained shift of scene from Paris to Tours may be made. A title such as *In the heart of the Chateau country lies Tours* would furnish a connecting link. This involves the first rule: *Use titles where they are necessary to explain sudden shifts in subject matter or breaks in the logical development of the film.*

Another important function of titles is their facility in stimulating curiosity or anticipation of sequences to come. The effect of some of our most dramatic scenes may be lost or at least hampered if a title is not used to stimulate the

curiosity of the audience. Hence the rule: *Insert titles before sequences where they will arouse the curiosity of the audience and stimulate its interest.* An example of the application of this rule is the title, *The king of the corner lot*, which preceded a sequence of a goat exploring a pile of tin cans. The wording of the title naturally arouses curiosity about the following scenes and causes the audience to wonder what is coming next, and thus holds attention.

Often we wish to enhance the dramatic effect of a scene or, indirectly, to emphasize some quality in it, building toward a climactic effect or providing a high spot in the film. This brings us to a third rule: *Insert titles where they will increase the dramatic value of a scene or sequence.* The title, *The heavy waves pound ceaselessly against the cliff*, spliced before a sequence of scenes of the ocean beating against the rocks, is an instance of the use of this type of title. You will note that it gives no additional information but that it does reinforce the effect of the scenes. It makes action appear dramatic and important that might otherwise seem to have no special significance. It strengthens the emotional effect.

Our fourth rule is: *Place titles where you wish a pause in the action or where you wish to indicate a new train of thought.* After a long series of scenes about a similar subject, a pause in the sequence of scenes is often desirable, if for no other purpose than that of creating a feeling of leisurely tempo throughout the reel. Such titles would also ordinarily cover the purpose of one of the first three rules noted above. The use of titles to indicate a new series of sequences following a line of thought slightly different from the preceding one is very important. In a travel film this use would be demonstrated by a title indicating the visit to a new country and, in a scenic, by a title that would signal a shift in the general subject matter. In a scenic reel of flowers an example would be the title, *But no gardener is needed outside the walls*, to follow sequences of wild flowers and natural scenery. Such a title, so situated, tells the audience that we are leav-

ing the cultivated garden and that a slightly different subject will be introduced, although note that it does not definitely tell what the subject will be.

A fifth rule in placing titles is: *Insert titles where information is necessary to make the succeeding sequence understandable.* Such informative titles are also used to add to the interest of a scene by giving dramatically interesting facts that cannot be presented in pictures. Although this is the commonest use of titles, one should be very careful to avoid overdoing it. Especially in travel films, one is likely to feel that some bit of information is vital and worth recording in a title although it would actually be better left out. In writing titles, care should be taken not to "tip off" the audience and so tell them in advance exactly what is coming in the next scene. At the same time the necessary or important information should not be given point blank. Such titles as *This river is five feet deep*, or *The city wall was built in the 15th century* are disconcertingly abrupt. It is far better to give this information indirectly and to word it so that it fits in with the picture's general theme. Thus the information in the first title might be offered in such wording as *Only five feet deep, the river is unnavigable except by the shallow native boats.* In this instance, more information is included in the title and the wording is arranged to carry on a particular line of thought. It is always a good idea to make a single title cover as many purposes as practical and information should be so worded that it will not appear too much like a quotation from a text book or statistical table. The second example might be reworded, *Caen has long since outgrown its 15th century wall.* Here we add dramatic significance to the fact that the wall has stood since the 15th century.

Our sixth and last rule in the placing of titles is the most general and it is given as a factor always to be considered rather than as a specifically helpful guide. *Place titles where they will contribute to the continuity theme.* The purpose or *motif* of the whole film should always be considered when

planning titles. In every possible case, they should help to develop it. This can be accomplished sometimes by indirect reference to the picture's theme and sometimes no special wording is necessary.

Although the exact wording of a title—the choice of one phrase as against another—is largely a matter of personal taste and artistic judgment, formulae have fortunately been gleaned from past professional and amateur experience that may be used as tests of good titles and as guides away from bad title writing. Some of the following rules can be adapted, to a certain extent, to fit personal tastes but most of them are results of practical experience and disregarding them will result in poor or ineffective titles. They especially apply to average amateur subjects.

1. About twenty words is the limit for a 16mm. title. The professional word limit is generally set at twenty five but this is often too large for a small screen area.

2. No one title should contain more than three distinct ideas. The title, *We are met at the train for the roads are impassable and, since we must go by horseback, it is necessary to have a guide*, contains four ideas: a. we are met at the train; b. the roads are impassable; c. we must go by horseback; d. it is necessary to have a guide. To make the title efficient, we must cut out at least one of the ideas. This rule is not a matter of taste but the result of careful experimentation. There is a strong tendency to ignore it in industrial and publicity films where it is more important than in other types of reels.

3. A second of screen time for each word in the title is the professional rule. In 16mm. terms this means one foot of film (one half foot "Eight film") for each two and a half words. This rule should be followed except in very short titles where the footage can be cut down considerably. However, the footage of amateur titles is usually too short.

4. Don't write such long subtitles that "traveling titles", or more than one title frame, are needed to contain the

lettering. This point would seem to require no emphasis after rules one and two. However, movie makers who usually observe these rules are inclined to feel that an exception should be made if they wish to present a very large amount of information in a title. This, again, is especially true of industrial and publicity films. Experience has proved that such titling is a strain on audience attention and is, therefore, inefficient. In almost every case, it is possible to break up such a title, making several shorter ones that comply with the rules, and to splice them in between scenes that will help convey the meaning desired. This will get the information across to the audience more effectively.

5. Make each title complete in itself. Don't break a sentence into two titles separated by a scene. An example of the broken title is *Bagdad may be romantic*—, followed by a scene and then the rest of the sentence in the title,— *but it is certainly dirty*. The objection to this practice is that it is too obvious a method of holding attention.

6. Don't splice two titles together in succession but separate them with at least one scene. Here is an example: *The visiting nurse pays a daily call*, followed immediately with the second title, *She sometimes finds worse conditions than these*. . . . In cases like this, an appropriate scene or sequence should be inserted between the two titles. Two titles spliced in succession is one of the commonest and most unnecessary of amateur faults.

7. Don't lead directly into the following scene with an incomplete sentence. The second half of the title in the above paragraph illustrates a violation of this rule. Another illustration would be the title, *In Peru you see such sights as these*. . . . While such titles avoid "tipping off" what is to come, they are too obvious means of holding attention.

8. A title should refer to the scene following but never to the scene preceding it. Such a title as *Did you see the ducks in the reeds?*, referring to the preceding scene, invariably confuses the spectator. While he is deciding

whether he did or did not see the ducks, he will not be able to give full attention to the succeeding scenes.

9. Use as simple words as possible in titles. This advice is not a reflection on the brain power of your audience but is suggested by the advantage of making the title inconspicuous. The most successful title is one that is read without consciousness of the medium, the idea being implanted in the mind of the spectator and carried until the next scene is flashed on the screen to complete its meaning.

10. Ordinary rules of grammar and punctuation apply in title writing. Amateurs often leave out punctuation in titles, feeling that it is not needed. However, a title should be as carefully punctuated as any other form of composition.

11. Write titles from an impersonal viewpoint and rarely, except in family films, refer to yourself, members of the family or friends by their proper names. In planning titles, try to think of yourself as an outsider who is preparing films for an audience that he has never met. Of course, in personal films, family reels and film diaries, this point does not apply.

12. Don't comment in titles on situations that are not represented in scenes or are not directly connected with them. Don't introduce references in titles to things that happen to the cameraman or to something that occurs behind the camera. Don't comment on photographic results. Such titles as *We wanted Dolly to pose with the Taj Mahal but she wouldn't* and *The Cameraman got nervous here or Excuse the underexposure* do not add much to the entertainment value of the film and, after you have seen them for the twentieth time, you will likely agree.

13. Introduce humor whenever it fits with the subject but don't introduce it independently of the succeeding scene. You cannot tell a joke in a subtitle unless part of the joke is in the picture.

14. *Title backgrounds* or other title decorations should never be so ornate or so complicated that they interfere with the legibility of the wording. Often the titles of amateur films that have been photographed and edited with great care are so "fussy" that the wording can hardly be read. In other cases, decorations, such as wide borders or a drawing of a proscenium arch, take up so much space that there is not adequate room left for the lettering. This relationship between ornament and wording is entirely illogical. In planning a layout for a title, one should keep foremost in mind that the most important thing about the title is the wording and the most important thing about the wording is its relation to the subsequent scene or sequence. Everything else is incidental and, therefore, it is far better to make the title too plain than too ornate.

15. *Trick titles*, achieved by means of *animation*, reverse motion and *double exposure* (see Chapter V for animation, Chapter I for reverse motion and Chapter IV for double exposure) fit with topical films, personal films and trick reels, but they should not be used as subtitles in scenic, travel or sport films. To a certain extent, the application of this rule is a question of taste. There are cases where a title, double exposed against a scenic background, is very successful. Nevertheless, it is usually better to leave such titles to enliven the personality film or newsreel. A beautiful scenic or an interesting travel film does not need such enlivening.

16. Do not vary the style of ornamentation or lettering of the titles within a particular film. There may be a difference in style between lead titles and the subtitles in your pictures, but no other variation. Once having determined the type and ornament for your subtitles, you should follow it throughout. Variations betray the inexperience of the maker and distract the attention of the audience.

Making your own titles

Although commercially made titles of all descriptions may be had at very reasonable prices, the continuous desire of the amateur to create every part of his own screen picture makes the actual photographing of his own titles a most attractive idea. Making titles, with all of their fascinating possibilities, is not at all difficult. This discussion deals with the operation involved in making the regular, garden variety of titles. Much ingenuity can be exercised in combining title making with the trick effects described later.

When making titles, it is desirable to use a lens with a focusing mount, unless one of the special, small *titlers* (devices for photographing titles) is used. The reason for this is that the ordinary fixed focus lens will not cover sharply under five feet. With the portrait attachment, this may be cut down to three feet, but, often, this is farther away from the camera than the amateur wishes for the size of the copy that he is using. However, special portrait attachments are provided for some lenses. If this is the case, the foregoing would not apply because these often cover objects as close as one foot from the lens.

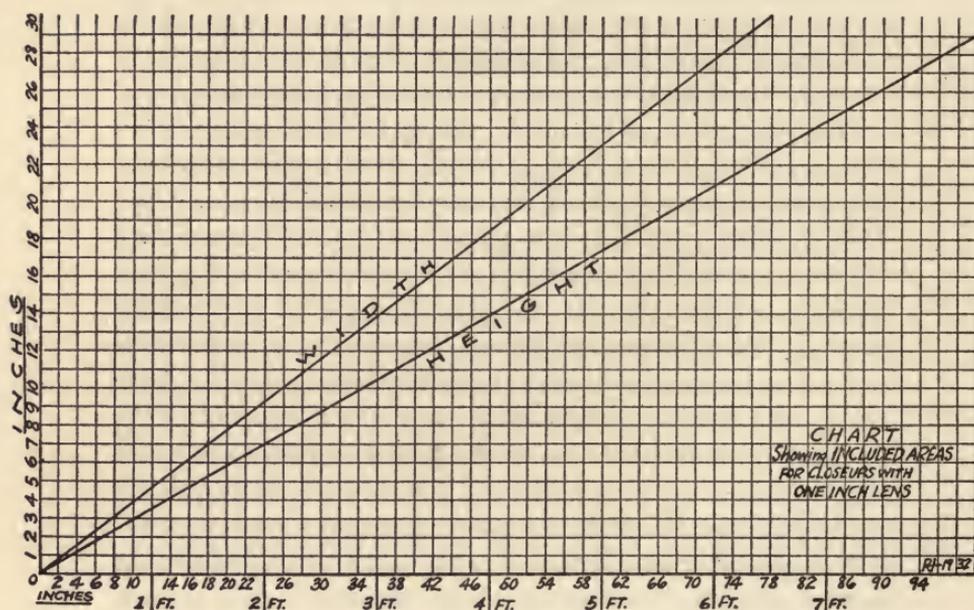
One way of overcoming the difficulty encountered with the lack of a focusing mount is to use a small diaphragm opening. This increases the depth of field and, of course, can be used only in good illumination. It is not recommended, however, as about twenty eight inches is the closest distance in which the camera may be used. The portrait lens must be used with this method.

In making titles, several methods are available. The first and easiest is to make use of the small, compact title making devices which provide an easel that holds a card, about three by four inches, at the proper distance from the camera, the latter being attached to the base of the device and provided with an auxiliary lens to insure that the camera lens shall always be in focus. The use of such devices makes

titling easy; full instructions as to its use will be found with each apparatus. The chief question in this case is, "What light shall I use?" Such small title surfaces are easily illuminated by the aid of one Photoflood bulb, already described. This should be placed in an efficient reflector and so directed that the title surface will be illuminated as evenly as possible. Be careful, in using such a bulb, that no direct light falls on the lens of the camera or on the auxiliary lens of the titler. The use of two bulbs, placed one on each side of the title, will give a more even illumination and allow the use of a smaller stop with consequent increase in sharpness.

Another effective means of making titles is found in the separate, larger sized boards which have a non reflecting, black background, made of felt or other absorbent material. Celluloid or paper letters are affixed to such backgrounds by various means, after which the title is set up at the proper distance in front of the camera, illuminated and photographed. In all cases involving the use of a separate title board not held in fixed relationship to the camera, the problem of centering must be solved. Since the viewpoint of the finder is separate from that of the lens, on closeup distances such as these, the finder will not center the titles correctly and should not be used for this purpose. The most convenient method for centering the title will be to arrange the camera upon a firm tripod close to the edge of a flat, horizontal table top. The title surface is so arranged that it will be upright in a plane perpendicular to the top and so that it may be slid along this surface toward or away from the camera. The title surface is then moved close to the camera lens and the height of the camera on the tripod is so adjusted that the center of the taking lens will point directly to the center of the title area. In all cases, the plane of the title board must be parallel to the plane of the film in the gate; this condition may easily be brought about by "truing up" with a carpenter's trysquare. With the lens pointing directly at the center of the title surface, the title board is

slid back along a straight line until it is at such a distance from the camera that the area of the title, only, will be included in the picture. This distance may easily be read from the accompanying chart, which shows exactly the dimensions of the title area included on the film with a one inch lens at any given distance. Along the bottom of the chart are seen the figures 0, 2, 4, etc.; these represent the



distances from the camera to the title card in inches; each division represents two inches. The vertical axis is also divided into inches but, here, each division represents one inch. If we wish to find the width and height of our title at any distance from the camera, we locate this distance in inches at the bottom of the chart and we follow vertically upward in a straight line from this division. The point where this straight line intersects the "height" diagonal will give us the height of the title, by taking the point of intersection and following straight across, horizontally, to the vertical

scale at the left. Similarly, we follow the same original straight line upwards, until it intersects the width diagonal and repeat the procedure. In making titles, always remember that the projector aperture is smaller than the camera aperture. For this reason, if our title letters go right to the very edge, it may happen that they will be cut off from the screen by the smaller projector aperture. Hence, it is always well to keep the lettering together in a mass near the center of the title, leaving a generous margin all around to the edge of the title card.

Many amateurs, wishing to spare themselves the trouble of centering their title board anew at each titling session, will conceive some convenient arrangement by which the board may be held always in a fixed relationship to the camera. A flat, plane board can be used for a base; at one end of this, a drawing board can be mounted in an upright position to hold the title card. At the other end of the base board at the correct distance away, the camera is mounted on a block of wood at the appropriate height and may be held in place by a bolt fitting into the tripod socket. Some means must be provided to keep the camera always pointing true and straight at the title surface; this may be done by using a wooden or metal guide. If the title board is arranged to slide toward or away from the camera in a straight line, different sizes of title surfaces can be used with this device. If the entire apparatus is arranged so that the title surface is held horizontally with the camera suspended above it, a most convenient means of arranging title material will be provided.

Title exposure

It is always well to provide plenty of light for titles as, in this way, the lens may be stopped down and sharper results will follow. Two lamps, one on each side of the title, give a better means of illumination, because, with one lamp and

with the larger titles, the lighting is not likely to be uniform. Ordinary panchromatic film may be used for titles, the use of superspeed film being unnecessary. The best results in making titles with white letters on a black background with reversal film are gained by very slight underexposure. With an average title surface of 9" x 12", illuminated by two Photoflood bulbs, one on each side, the stop to be used with ordinary panchromatic film should be from $f/8$ to $f/11$. In placing the lights, be careful that you do not get direct reflection from the smooth surface of the title board. Place your eye as near the lens as possible and note whether any of this reflection occurs; it will be easy to see. If such is the case, move the lights to a slightly different angle until the glare disappears.

Positive titles

The use of positive film for making titles is valuable in that it gives sharp, "contrasty" results, a desirable thing for most titles. This film has a special, slower emulsion and may be bought in one hundred foot units on daylight loading camera spools or purchased in rolls and spooled in the darkroom. This film may be handled by the light of the ordinary, red safelight lamp and such spooling is easily accomplished. The film is wound so that, in passing through the camera, the dull or emulsion side will be toward the lens. When the title is shot, the film is developed and fixed as a *negative*. Thus, the tonal values of the title are reversed, that is, the letters appear white and the background black, which provides the most successful kind of amateur titles. In preparing title cards to be used with positive film, the lettering should be done with India ink on a white card. The process of shooting titles is the same as with other film, except that the exposure must be increased by the value of two stops. If it is desired to use backgrounds or photographs as direct positive title cards, it is necessary only to have them made into negative paper prints and to letter on

them in black. These prints can easily and cheaply be made, by means of the "Photostat" process, and enlarged or reduced to any size.

Special titles

Titles in full color are entirely practical for color films by means of the Kodacolor process and should be shot in full sunlight. Ordinary black and white titles, however, are best shot by artificial light as, in this case, the most favorable conditions, once known, may always be duplicated. A double exposed title effect may be made in one shot by pasting the title letters on a clear sheet of glass, focusing the lens on it and then shooting through the glass at an appropriate scene beyond. An interesting effect may be had, in this way, by focusing first on the background and then bringing the letters, themselves, slowly into focus while the camera is running. In making glass titles, be sure that the smooth surface of the glass does not reflect direct light into the lens from any source.

CHAPTER IV

IN FULL SWING

Fading devices Special effects intended to enhance the dramatic or pictorial value of the film are produced by certain apparatus whose function it is to alter or define the image in some way; such adjuncts are usually placed in line with the lens and the results they give are generally known as *before the lens effects*. The simplest of these effects is that known as the *fade*. Its purpose is to create a gradual darkening or lightening of the scene at the end or beginning of a film so that this scene, instead of appearing abruptly, in the twinkling of an eye, will start as a dark screen and will gradually lighten until the details of the image are seen in correct exposure. The fade is most easily performed by means of a *fading glass*, which is simply a narrow strip of clear glass, transparent at one end and merging into opacity at the other. If such a glass is held in front of the lens, it may be drawn gradually from one side to the other, so that the image will either gradually be cut off or will gradually appear. The rapidity with which the glass is moved controls the duration of the fade. Before fading out, the balance of the scene must be shot through the clear end of the glass; otherwise, the introduction of the edge of the glass in front of the lens will be noticeable in the finished picture. A homemade fading glass may be made by cutting a strip, about two inches wide and five or six inches long, from an old photographic plate which has been thoroughly cleaned. This strip may be coated in a sooty flame, so that the coating merges from a

very thin deposit near one end into a very heavy one at the other. Such a coating is easily rubbed off, but it is just as easily renewed. A little practice will show how to smoke the glass evenly. Commercial forms of these devices are available, including one in which a disc, etched with graduated lines, is revolved in front of the lens by clockwork. In using a fading effect in reversal film, it must be remembered that this will appear to the automatic processing machine as a progressive underexposure and that a certain compensation may be noticed. Nevertheless, such fades are effective, because they do cause a gradual disappearance of the image.

The iris

This is a device similar to, but larger than, the iris diaphragm contained in the lens. It is held at a certain distance in front of the lens, by means of an extension of the lens barrel or by a rigid framework. The *effect iris*, as it is called, should not be placed too close to the lens; in fact, the larger it is and the farther away from the lens that it may be placed, the more sharply defined will be its effect on the film. The iris, properly adjusted, shows the picture on the screen as a circular light area bounded by black; this area may be fixed or variable. Such a device is valuable to center the interest on any object in the middle of the frame. The usual iris is fixed, so that it closes down only in the center of the picture, but a larger type of "floating" iris may be had which enables the cameraman to concentrate the "spotlight" effect of the iris on any portion of the frame.

Lap dissolves

This is an effect which results from a simultaneous fade in and fade out, each made at the same speed and *on the same length of film*. Thus, as one scene disappears, the next scene reappears over it in the same proportion and the

effect is that of one scene melting into another. It is obvious from this that, if one portion of the film is to be exposed twice, this part must be rewound to its original starting point for the second exposure. This may be done by taking the camera into the dark room and rewinding the film by hand, but it may most easily be accomplished in those cameras which are provided with a back cranking feature, by which the film may be wound backward, at will.

Other effects

Additional before the lens effects are had by placing variously shaped openings or transparencies at various distances in front of the lens. The greater the distance the effect surface is placed from the lens, the more sharply defined the effects will be. Five inches is a good, average distance; sheets of opaque material held at this distance from the lens should be about two inches wide and an inch and one half high. Such cutouts (diamond, keyhole or other shape) are called *mattes* and the device which holds them, a *matte box*. Such a device, complete in every detail, is commercially available for amateur work. The *white iris* is merely a translucent matte with a clear opening in the center, giving the picture a border of gray. A fog or diffusion effect may be had by using mattes of various materials. A matte made of cheese cloth, stretched in a frame, will give an interesting diffusion effect. *Fog filters*, for introducing the effect of haze into a scene, may be had in varying degrees of density. Diffusion effects are also produced by caps which fit over the lens barrel and by special lenses. An interesting effect device is to be had in the *fifty fifty filter*. This is really a means for filtering various portions of the view selectively. The filter has two portions with a line of demarcation between. The upper portion usually gives the denser filtering effect and may be used to reduce the tone of an otherwise too bright sky, while leaving the fore-

ground much more lightly filtered. A filter of this type should be used in a matte box and not placed too close to the front element of the lens.

Double and multiple exposure

By means of a device which will crank the film backward, as outlined previously, it will be seen that various events which take place in different locations or at different times may be superimposed upon the original scene. If one object is registered, the film rewound and another registered directly over it, a "transparent" effect will be produced, which is often used to produce ghostly views. For instance, an ordinary interior is taken with a subject in an appropriate attitude, the lens is then covered and the film rewound to the beginning of the scene. The same portion is then reexposed on the "spook", who is dressed in white and is photographed against a dead black background. The lens opening in the second exposure is purposely made less than that of the first. The effect will be that of a transparent "ghost", gliding about the original setting. Double exposure may also be used to introduce extraneous images into scenes already taken, in the following way. In that portion of the original scene where the image is to be introduced, a dead black background is provided. The scene is photographed and the film is rewound. The secondary exposure is made by placing the extraneous subject in the scene (that is, locating it in the finder frame) in such a way that it will coincide with the original black background. This secondary subject is shot against the black background, which should cover the entire view as seen in the finder. If correct measurements have been made, the final film will show the two subjects correctly exposed in proper position throughout the whole sequence. If both of these subjects happen to be the same person, a very mystifying effect is produced. Instead of large, black areas introduced

into the scene, itself, any portion of the scene area, required to be masked off in double exposure work, may be eliminated by the use of a matte box and opaque masks, with the proper portions cut out. With planning, care and patience, this method may be used to make as many separate exposures on one film length as are desired. Such a process is known as *multiple exposure*.

Using fades, irises and dissolves

Fades, iris effects and dissolves are very useful ways of opening and closing scenes and the amateur who has developed to the point of using them will find that they are important additions to his picture making facilities. Of the three, the fade is, perhaps, the most generally useful because of its comparative simplicity and because any movie maker can closely approximate the effect by use of a fading glass.

The fade is particularly valuable in indicating a lapse of time. For example, if, in a film of building operations, it is desired to suggest the lapse of time from the construction of the framework to the completion of the building, a slow fade out on the scene of the framework coupled with a slow fade in on the scene of the finished building will convey the impression of the passage of time as forcefully as any method. The fade is equally useful for symbolizing shorter periods of time. A fade out on the family leaving the house for a trip to the country home and a fade in on the arrival will do away with the need of scenes in between. Another general use of the fade is to indicate a story within a story. Many amusing simple photoplays are based upon dreams and a fade out on Bobby going to sleep and a fade in on the story of his dream will make the shift of ideas seem reasonable to the audience. Similarly, one may fade out on the closeup of the face of a person speaking and fade in on a picturization of what he is saying. Visions and memories may likewise be treated in this way. A scene of an angler

day dreaming in his chair may fade out and a scene of himself fishing may fade in.

The fade produces a feeling of disassociation or a lapse of time and it should not be used unless this effect is desired. To fade in and out on a series of scenes without cause would produce a choppy, confused effect. Of course, it is always safe to fade in at the beginning of a picture and to fade out at the end.

The iris is largely an ornamental device, sharing some of the properties of the fade. It will indicate a time lapse, a story within a story and a change of subject, although not so effectively as the fade. The iris has a special advantage for, since it narrows down the field of vision, it may be used to emphasize some particular portion of a scene or some object within it. A commonplace example is the "iris out" on a waving flag that sometimes closes patriotic pictures. In an amateur photoplay of a mystery story, one might iris out on the significant clue. In a few cases, the iris might be used to connect two scenes. For instance, in a scenic film, one might iris out on a shot of a waterfall, cutting the scene down until there was nothing but the water flowing past. Then one might iris in on a scene of another waterfall and splice the two shots together. Try it, if you use an iris.

The dissolve has a wide variety of cinematic uses but, unfortunately, is limited to few amateurs. It may be employed to indicate a lapse of time, especially a short lapse of time, and it is the best device for representing thought processes or memories. It conveys a stronger feeling of connection between scenes than either the fade or the iris and, hence, it is very adaptable in bridging gaps in a story. For example, in picturing the steps of manufacture in a factory, one may effectively dissolve from one stage to another. It is often effective to dissolve from a medium shot of a subject to a closeup of it, as a substitute for cutting. So strong is the effect of connection that one may use it in presenting parallel action, that is, action represented as taking place

at the same time as some other action in the film. For example, in a boys' camp photoplay, one could dissolve from a scene of one of the boys locked up in the villain's cabin to a scene of his rescuers hunting him.

In scenics and travel films, the dissolve is very helpful in shifting from one sequence to another. One may effectively dissolve from a shot of the boat at the pier to a view of one's hotel in Paris. An active movie maker has probably not missed the frequent use of this kind of dissolve in professional travel pictures.

Simple dramatic films and photoplays

Because the professional movies have established so elaborate a precedent, amateur movie makers hesitate to tackle dramatic films or simple photoplays. Not infrequently movie amateurs do this because they feel that the effort would be, in some way, undignified and worthy only of Hollywood struck youngsters. This is unfortunate, because making a dramatic picture not only yields a lot of fun but it also suggests experimentation with filming technique which will have decided value in more usual types of picture making. With interior lighting and filming as simple as it now is, due to fast film and convenient, inexpensive lights, every man's house may become his studio for the production of as short or as lengthy a plot as he desires. Filming a hundred foot (fifty foot "Eight film") photoplay may be substituted for an evening of bridge, it may take the place of more prosaic entertainment at an afternoon party or it can be worked out on a holiday afternoon. Groups may organize informally to make more ambitious pictures and all sorts and types of photoplays, from fifty foot fables to eight reel features, have been produced by amateurs. A fairy tale or a wild west adventure story will delight the children and it gives them an opportunity to wear their play clothes before the camera. Since children have a natu-

ral mimetic ability, they make first rate actors. Such photoplays frequently provide parents with the best movie portrait shots of their youngsters.

However simple or ambitious the plans of a photoplay filmer may be, the golden rule is to select the plot to fit the shots. Less tersely put, this means choosing the story to fit the backgrounds, the people, the objects and the locations that may conveniently be used in the picture. If you are at the seashore, make a picture that utilizes the seashore as the *mise en scène*. If you are living in an apartment hotel, choose a plot idea that can be filmed in one or two rooms, with perhaps just a casual scene or two on the street. If the plains stretch away from your door, a wild west picture is indicated and if you own a tennis court, a story with tennis as its theme suggests itself.

There is no limit to the kind of stories that may be had and there is no reason for not featuring yourself and your family and friends in a photoplay as well as in any other type of picture. Make the plot fit your needs rather than going out of the way to gather a lot of "sets", "properties", "character actors" and other concomitants of the professional photoplay.

The first answer to the question of where to get the plot is to write it yourself. Plots, elaborate enough for the amateur photoplay, suggest themselves very readily when one has looked over the possibilities of the background that may be used. All of the plot ideas of the old silent movies, the plots suggested by "short short stories", those used in comic strip sections of newspapers or the fundamental plot situations of literature are grist for the amateur's mill.

Here are four plot suggestions that can be adapted to almost any background:

1. The villain steals the girl. The hero tries to rescue her but the villain catches him and ties him up. He is an unmitigated villain, so he also ties her up in a kitchen chair and places a bomb beneath it. (Made from the kitchen

clock, string for fuse and a small box for the bomb.) The hero strives to get free to rescue her. Will he do it? He does. In the nick of time, as the closeup of the clock face plainly shows.

2. The children are playing "whites and Indians". The Indians are closing in on the white encampment with intent to massacre. The whites are holding them off but are running out of food. One of the girls is despatched for food. She must go through the Indian lines. She succeeds finally and brings back the food (cookies and milk) and the whites, thus enheartened, rout the redskins entirely.

3. One of a group of friends can't play bridge. In two or three scenes of a bridge game it is shown that he is worse than a dub—he is terrible. He is in love with a girl who is expert. He takes bridge lessons (in the next room, where one of the group plays the role of a leading bridge instructor). He comes to another party, ready to make a good impression on the girl. He is so good that it is annoying and the girl is jealous. She takes the other man.

4. Jerry is a poor golfer as everyone knows. A visiting player from another town brags to everyone of his skill. All are afraid to play him, but Jerry is so dumb that he is willing. He plays and, by a series of flukes, beats the visitor.

All of these very short plots have one element in common. They state a problem, they develop it, bringing in an element of suspense, and then they end with a definite climax. In the first plot, the problem was stated when the villain kidnapped the girl. The suspense was introduced with the question of whether the hero would rescue her in time; the climax came when he finally succeeded.

The suspense element in number two was introduced with the question of whether the girl would make her way through the Indian lines or would be captured. In number three suspense lay in whether the boy would get the girl or lose her, and, in the fourth plot, we wondered what would happen to Jerry. Every plot should state a problem and

develop it, bringing in the suspense element as to what is or is not going to happen, and should reach a climax with a solution. Of course, some plots are intentionally left up in the air, but the amateur will find it simpler to deal with the more direct type that follows these three simple requirements.

Plots three and four bring in another element, that of the surprise ending. One does not expect the bridge dub to become so good that his circle will disown him and his girl desert him. One does not look for the dub golfer to beat the expert, although a movie wise theatre goer will "smell a mouse" in this one, perhaps. A surprise ending will rescue a poor or indifferent plot from a dull finish.

Of course, the plots presented are of the most simple and melodramatic kind. They were chosen only as convenient and brief examples of the principles of plot construction and it is easily possible to work out less hackneyed themes. Nevertheless, such stereotyped plot ideas make excellent subjects for first experiments with simple photoplay making.

Any of the four plots above could readily be elaborated. For instance, in number two, the girl might be captured by the Indians in her attempt to get through. She might subsequently be rescued by one of the whites and together they might bring in the supply of food. All sorts of developments may intervene between the establishment of the problem and the final solution. These developments lengthen the story and, at the same time, carry along the suspense. Simple plot construction has been summed up as follows: Someone wants something and tries to get it; obstacles are thrown in his way by man, nature or both; finally he succeeds or fails and the plot reaches its climax.

Adapting a plot to fit individual needs is easier than it appears at first. This is important, for plots usually require simplification for amateur production. The source, a short story, a play or a funny paper incident, will ordinarily con-

tain scenes and characters that are beyond amateur range. A process of elimination and simplification is necessary to get the plot idea into condition for the amateur to handle readily. Scenes may be shifted and characters may be eliminated. For example, if an interesting story of rum runners requires a yacht, very likely a motor boat will do just as well, after the incident of the dance on board is cut out; another story that is laid in the mountains may be shifted to the plains, if that is where you live. The villain, who in the story is deformed and who would require complicated makeup for the movies, may be changed to a more suave type. The whole story may be shortened considerably by cutting out some of the complications. All sorts of changes may be made without affecting the fundamental plot idea, which is the most important thing.

It is wise to choose a short and relatively simple plot that can be presented within a 400 foot film length (200 feet of "Eight film"). Problems in producing a longer picture increase in considerably greater proportion to the increased footage. An 800 foot (400 foot "Eight film") picture is much more than twice as hard to make as a four hundred foot film. Amateur movie makers almost always tend to select long and too complicated plots for their photoplays. This frequently results in a much poorer production than need be, because, during the filming, effort is made to compress the story into a limited amount of footage or filming time, and the result is lack of clarity in the finished product. Almost always, it seems that a plot will require less film than it actually does. Be on the safe side and choose a plot that is considerably shorter and simpler than you think it need be.

The plot selected should be simple and direct and, for the beginning amateur photoplay producer, at least, it should require very little subtle acting or movie effects. Broad, obvious plots will be much easier to film and much more successful on the screen. Avoid difficult characteriza-

tions and roles that would require much makeup. Work out your plot to use the people available and to make the most of their abilities or of their natural appearance. The plot should require few conversational titles. Many short stories are valueless for the silent movie because they are largely dialog. A plot for the movies must be of a type that can be presented in pictures. What is commonly called an "action story" makes the most understandable silent photoplay, while a drama of ideas makes the poorest. To sum up, the best plot for amateur production is a short, simple, action story that requires no settings, characters or properties other than those available to the amateur producer. There will be few conversations and no situations that call for advanced acting ability or characterization.

If it seems impractical to write a plot to fit your needs, you may apply to the Amateur Cinema League for a Plot Service Chart and, through this, secure a plot outline prepared to meet your individual requirements. The Plot Service Chart may also be used to secure plots for more elaborate photoplays for groups.

Scenarios

After a suitable plot has been adapted by the amateur or prepared for him by the Amateur Cinema League, the next step is scenarization. In case the plot is prepared by the League, the scenarization is relatively simple, for the plot outline is written in a semi scenario style and directions for scenarization are included wherever the treatment is at all out of the ordinary.

A scenario is a version of the story in which the action is split up into movie scenes, with filming instructions appended to each scene. Titles are included and the completed scenario is practically an architectural blueprint of the finished film. It is a written plan that enables the amateur movie maker to shoot the scenes without complications. It

provides him with a complete guide for production. In making short photoplays, it is possible to do without a scenario but it is never advisable.

Reduced to its simplest form, a scenario is simply a list of movie scenes such as these:

- Scene 1. Dorothy is in the garden, picking flowers.
- Scene 2. Jack drives up in front of the house in his roadster; he gets out of the car.
- Scene 3. Dorothy picking flowers in the garden; Jack comes into camera view; Dorothy sees him and smiles; Jack smiles at her and, taking Dorothy in his arms, kisses her.
- Scene 4. Tom, standing in the garden, is looking past the camera, with a jealous expression.
- Scene 5. Dorothy and Jack. Jack releases Dorothy and gives her a box of candy.

Every time the scene changes, a different camera position is taken. Such a listing of scenes makes it very convenient to film the picture. At each stage, the movie maker will know exactly what has been done and what remains to be done. However, it accomplishes something even more important—it has divided the action into *scenes* that can be filmed with the camera in one position. It tells the cameraman exactly when it is necessary to take a new camera position. Breaking the action of a story up into scenes that can be filmed satisfactorily with the camera in one position is the most important phase of scenario writing. It would have been conceivably possible to have filmed all of the scenes cited with the camera in the same position but, if this had been done, the picture would have had very little meaning; it would have been necessary for the camera to be so far away that details could not be seen. The smiles, for instance, can be shown only in closeups. Also changing camera positions gives needed variety.

The greatest fault in scenarizing is putting too much action into one scene. For example, many amateurs might be inclined to use but one scene for Nos. 1 and 2. If the garden were near the street, it would be possible to film Dorothy picking flowers and Jack driving up in front of the house and getting out of the car. That would be undesirable because the audience could not get so good a view of the characters, if they were together when first seen. Dividing up the scenes introduces the two characters one at a time, letting the audience become acquainted with each singly. In preparing a scenario, whenever a scene has been determined upon, carefully criticize it to decide if the acting would not be presented better by splitting it into two or more scenes. Frequently, movie makers will write a scene that could not possibly be filmed from one camera position. For example, "John opens the front door, walks into the kitchen and speaks to the cook" puts up a real problem. Unless the camera were on roller skates or a trolley, it would be impracticable to follow John's peregrination in one scene.

In addition to indicating the action that will be filmed in one camera position, a scenario contains directions for the position of the camera with reference to the subject. The most important of these directions is the distance from camera to subject. Therefore, we have the terms *long shot*, *semi long shot*, *medium shot*, *closeup* and *semi closeup*. These serve as rough guides for the distance from the camera to the action that is being filmed.

A closeup is a camera distance that just frames the head and shoulders of the subject in the viewfinder. Semi closeup refers to a camera distance that frames the subject from the waist up in the viewfinder. A medium shot is a camera distance from the subject which roughly includes the whole body from head to foot. A long shot refers to a camera distance from the subject, great enough that the features or the persons in the scene could not be distinguished. A semi long shot is a compromise between

a long shot and a medium shot. These terms are not inflexible. A closeup, for instance, might show only the face or it might include a bit more than head and shoulders. A medium shot might be a bit closer than a view which would include all of the bodies of the people in the scene. These terms are accurate enough for the purpose of writing the scenario and roughly indicate the camera positions needed. The exact distance should be determined by the cameraman when he is filming.

Inserting directions for camera positions into our model scenario would result as follows:

- Scene 1. Semi closeup. The garden. Dorothy is picking flowers.
- Scene 2. Medium shot. Front of house. Jack drives up in a roadster and gets out.
- Scene 3. Medium shot. Garden. Dorothy picking flowers. Jack comes into the scene and Dorothy, seeing him, smiles. Jack smiles at her, and taking Dorothy into his arms, kisses her.
- Scene 4. Semi closeup. Garden. Tom, standing and looking past the camera with a jealous expression.
- Scene 5. Semi long shot. Garden. Dorothy and Jack. Jack releases Dorothy and gives her a box of candy.

In scene 1, a semi closeup was used in order to give the audience a very near view of Dorothy, who is the heroine of the picture. Also, a semi closeup was all that was needed to provide background to show what she was doing—picking flowers. In scene 2, a medium shot was needed to get the car and Jack into the picture. To get both Jack and Dorothy into the picture and to show them greeting each other required a medium shot for scene 3. In scene 4, we bring in a new character, Tom, and, at the same time, we want to show the expression on his face, so a semi closeup is indicated. Scene 5 is intended to present Dorothy and Jack

from Tom's viewpoint, so a semi long shot is employed. We want the camera close enough so that the audience will know that it is seeing the same people as in scene 3 and we want it far enough away to present the action through Tom's eyes. Carrying the story along, scene 6 would be another semi closeup of Tom as he showed jealous rage at the thought of Jack's giving the candy to Dorothy. A general rule may be offered to help both in scenarizing and in filming: *the camera should be placed as close as possible to the action without excluding any part of it or of the background essential to the story.* If it had been necessary in scene 1 to show Dorothy strolling in the garden, a closeup would not have been possible. If, in scene 3, it were not desirable to show Jack coming into the garden, we might have used a semi closeup, for the embrace could be included with the camera that near.

In the second version of the scenario, it will be noted that a slightly different order of words was used. The description of the scene was headed by the setting or background of the scene. This is done purely for convenience. In glancing at the *script* (another term which means the same as scenario) the amateur cameraman may easily find the location of the next scene to be made. The usual form for scenarization is as follows:

Scene number. Camera position (closeup, medium shot, etc.). Location of scene. Characters. Description of action.

When titles are needed, they should also be indicated in the scenario. In photoplays, titles are used to represent conversation between characters, to indicate a lapse of time or to fill in gaps in the story. Their commonest use is to represent conversation, and such titles are called *spoken titles*. They are invaluable aids in telling a story in silent movies because, with them, it is possible to convey ideas to the audience that could not be shown in pictures. Fol-

lowing the lead of the stage and the professional talkie, the amateur movie maker often tends to forget that he is dealing with a silent medium and will include too much dialog. Spoken titles must be used sparingly and the amateur producer must tell his story in *pictures* to get pleasant results. A long series of titles on the screen is not a movie. However, a moderate use of titles is almost essential in making a good amateur photoplay.

Spoken titles are inserted in the midst of scenes of the actor speaking the actual lines. The only way that the audience can know who is speaking the title is for it to be made plainly evident by the action of the speaker and for the title to be spliced in the midst of a shot that registers the lip movement of the character. An experienced photoplay maker can modify this rule, but it must be a law for the beginner who is making any kind of dramatic film. Other characters in the scene can help in identifying the source of the spoken title for the audience by registering appropriate reactions.

The following portion of a script illustrates the use of titles:

Scene 1. Medium shot. The beach. Bob and Jim (two boys) are bathing in the surf. It is evidently late in the afternoon, because Bob and Jim are the the only people on the beach. They are coming out of the water toward the camera.

Scene 2. Medium shot. The beach, further away from the surf. Bob and Jim are running past the camera toward the bath house in the scene. Jim is chasing Bob. They enter the bath house together, laughing and joking.

Scene 3. Semi closeup. The bath house door. It opens and Jim steps out dressed, his swimming suit over his shoulder. He pauses at the door and calls back:

Insert Title 1. "*Hurry up, Bob, we'll be late for dinner!*"

- Scene 3. Continued. Jim finishes speaking, pauses, walks away from the camera a few steps and waits a few seconds; then Bob appears hastily dressed. Jim is exhorting Bob to hurry. They walk together down the beach.
- Scene 4. Medium shot. The beach. Bob and Jim walk into the scene, laughing and talking casually. They come quite near the camera—almost a semi close-up—when Bob looks at the ground, pauses and indicates that he sees something.
- Scene 5. Closeup. The beach. A pair of footprints, made by a barefoot person, are plainly seen in the wet sand. The camera is tilted up to show the footprints continuing down the beach.
- Scene 6. Medium shot. The beach. Jim and Bob. Bob pauses and looks at the footprints, his eyes tracing them on to a pile of rocks in the distance. The footprints are visible in the sand and they are the only marks on the sand that are visible.
- Insert Title 2. *"Some chap has made for our cave—let's track him down."*
- Scene 6. Continued. Bob finishes speaking and Jim shakes his head, but Bob starts off away from the camera, following the footprints and Jim follows.
- Scene 7. Medium shot. The mouth of the cave on the beach. Jim and Bob are in the scene, walking toward the mouth of the cave. They approach quietly, with mock caution.
- Scene 8. Semi closeup. The two boys at the mouth of the cave. They look in. Jim sees something and his expression changes to surprise. He grips Bob by the arm and both boys look in.
- Scene 9. Semi closeup. Inside the cave. The burly arm of a man can be seen dragging what appears to be a heavy box along the sand. The body of the man is hidden behind rocks, but the position of

the arm suggests that he must be lying down. His arm about the slowly disappearing box bears a very large and obvious tattoo mark.

Note how the titles are fitted into Scenes 3 and 6 of this partial script. Scene 3 offers the simplest problem in arranging the action and camera position so that the title can be identified with the speaker of it. Only one of the boys is in the scene and he calls back to the other within the bath house. The title would be spliced in the scene at the point where Jim is just about to finish speaking. There would be about six inches (three inches "Eight film") of his lip movement at the first of the second part of the scene. In scene 6, the speaker is made obvious by the action. Bob grabs Jim's arm and points while he speaks. These titles accomplish several purposes. The first one, combined with the action of the story, tells the audience that these are two ordinary boys who have been in for a swim and are expected home at their dinner tables. It also identifies one of the boys as Bob. *One of the most valuable uses of titles in amateur photoplays is the identification of characters.*

Title 2 advances the story and explains the action to follow. It tells the audience that the boys, for the fun of it, are going to track the footprints to the cave. It tells the audience that there is a cave and brings up the question, "Is there anyone in the cave and, if so, who?" The second title, spoken by Bob, might include Jim's name and thus identify him. In this case, it seemed rather awkward and was not necessary, because we had already identified one of the boys. Subsequent action would bring out Jim's name. Note that quotation marks are used for these spoken titles and that they are punctuated just as they would be in the body of a story.

The story might have been introduced by an explanatory title, *Bob and Jim were in swimming one afternoon—*. This, or a similar wording, would have explained the action of

the story. However, the present handling is better, for it is more natural. Explanatory titles are necessary when the picture fails to convey the story without aid. If the story is not understandable without them, by all means use them, but it is better to substitute a series of scenes or spoken titles for the explanatory title.

Our model script does not furnish an example of the *time lapse title*, but that has been made familiar to most of us by the silent movies of ten years ago. Such titles as *Later that night*—or *The next morning*—were fairly common at one time. Not infrequently, amateur script writing calls for them to indicate the passage of time. In some cases, scenes can be substituted. A closeup of a calendar, with the leaves being torn away, will show the passage of days or months and closeups of a clock face will show the passage of shorter lengths of time.

The scenario brings out another point. Examination of scenes 4, 5 and 6 will reveal that 5, a closeup of what Bob sees, is encased by 4 and 6, two shots showing him looking at something. In this way, the audience is assured that it sees the footprints because Bob's attention is riveted on them. They see the footprints through Bob's eyes. This brings up an important rule; *whenever it is desirable to show a scene from the viewpoint of a character in the course of the story, first show him looking or registering observation in some way, then show what he sees from a suitable camera viewpoint and finally show the character again*. Like all rules, this has exceptions, but it is a safe guide for the beginning scenario writer.

The most vital consideration in writing a scenario is to be certain that the arrangement of the scenes establishes each important point of the story. Leave nothing to chance. Be certain that the script provides for closeups or semi-closeups of the characters, so that the audience can recognize them during the subsequent picture. Be certain that, if the background is important to the story, it is properly

registered. Be sure that the action logically fits the situation unless mystery is intended. In the script that we have considered, it would have been possible to have the boys merely walking on the beach. However, they were presented bathing, to establish a very normal reason for being on the beach. *Remember that the audience gets only what the picture tells.* It does not know the plot. In giving a scenario a final check, examine every scene from the viewpoint of its being plain and clear to an audience that knows nothing of the story. If any of the scenes fail in their duty, the audience will not understand the picture. Clarity should be the first aim of the amateur scenarist.

The cameraman will probably have to serve also as the director of the picture. If the group is a fairly large one or the picture is to run some length, this job may be passed on to someone else. Whether the cameraman or a friend is directing the picture, he should strive to make the action of the scenario natural and smooth. He must guard against the selfconsciousness of the actors and, at the same time, avoid abruptness in correcting it. The greatest fault of amateur actors is camera consciousness and they must be cautioned not to stare into the camera lens.

Complicated characterizations cannot be expected from amateur actors. Roles calling for strong or subtle emotions should be avoided, where possible, and, if used, they should be assigned to some member of the group with natural histrionic talent or amateur stage experience. In simple roles, such as those used in the various parts of the scenarios presented in this discussion, the amateur can do very well. He does not require any technical dramatic training—all he needs is a lack of selfconsciousness and a willingness to work out a natural interpretation of the scene. He must be told to put himself in the position of the character whose role he is presenting and to try to imagine that character's natural reactions. If the story is a simple action plot, no impassioned "acting" will be required and

the amateur can acquit himself very creditably—in many cases, surprisingly well. However, he is always the weak link in the chain, because he is the most uncertain.

Caution the actors to move slowly. The audience must be given time to absorb the meaning of gestures, facial expressions and movements. Each is intended to carry some significant bit of the story from the screen to the audience and, in order that this may be done, the actors must move more slowly during the picture making than they would do in actual life. Tell them to make gestures slowly and with emphasis, rather than quickly and casually. Tell them to pause after making dramatic movements. These pauses are important and, often, are more significant than the action itself. In the second part of scene 3, in the sample script, Jim's pause, after he finishes speaking, tells the audience clearly that he is waiting for Bob's appearance. In scene 6, the pause prepares the audience for some turn in the story. More pauses would be indicated by the director in rehearsing the action.

Two or three rehearsals are always wise. The director should go through the action before the actors attempt it. He can thus best convey a mental picture of what they are to do and his example will help to make them unself-conscious.

The director follows all of the action of each scene carefully, sees that it is executed in accordance with the scenario and that there are no ragged spots. He may improve upon the script slightly, for, during the actual dramatization of the scenes, little points that might profitably be changed will occur to him. If he is experienced, he may take even greater liberties with the script. The director will see that the costumes and the settings fit the scenario. Not infrequently, it is convenient to film at the same time a group of scenes laid in the same setting, even if they are separated by other scenes in the script. All of the street scenes of a script might be filmed in one day and all of the beach scenes

in our model script might be filmed on the same day and interior scenes the next day. This may lead to confusion, for an actor wearing an overcoat may walk off the street in a scene made the first day and into the house without it in a scene made the second day. The director watches for these possible errors and sees that the members of the cast do not forget such details. The more carefully such details are checked, the better will be the final picture.

Editing a photoplay follows the same technique as other editing, which was discussed in Chapter II. It is usually simpler, for the scenario provides a very exact editing guide. Particular care should be taken in trimming the scenes so that awkward and meaningless pauses do not occur at the end of scenes when the actors have completed the action of that particular scene.

The film enters your business

Amateur movie makers possess, in their cameras, not only the means of enjoying a delightful hobby but also pieces of equipment that may become useful and even very important factors in their business. Architects may record on film the growth of buildings that they have designed; manufacturers may make film records of the processes used in their plants, for the purpose of instructing salesmen. A real estate operator may make movies of the attractions of the land that he wishes to sell, so that the film may be projected for the prospective purchaser in a distant city; surgeons have film records made of important operations and welfare workers use amateur cameras in showing their supporters the conditions which they would correct. There is scarcely a single walk of life in which a film cannot be useful in selling, instructing, analyzing or in providing permanent and realistic records.

Amateur made industrial films have played their part in important industrial transactions. They have helped to

sell gigantic orders and, used for the purpose of time motion study, they have saved manufacturing plants hundreds of thousands of dollars.

A business or professional film merits a carefully prepared plan. The success of the picture will depend upon the crystal clear presentation of the idea behind it. The first and all important step in planning a business picture is the selection of the continuity or type of treatment. A convenient approach to the discussion of continuities for business films is supplied by separating them into various rough categories.

First, there is the industrial film made by the amateur for his own satisfaction, in much the same spirit that he makes a film record of his vacation. Should the movie maker's business be selling automobiles, for example, the film might be based on a story of a young couple who wanted to buy a car and who called at the salesroom for a demonstration. The picture would continue with the story of the demonstration and would conclude with the scenes of the customers buying the car. The idea might be more simply handled by eliminating the young people and merely picturing the demonstration of the car, using titles to emphasize important points. If the amateur is a manufacturer, the film might be a story of the steps in the production of the goods he sells. The picture would start with the raw products being received and would show the various stages of manufacture in logical succession, ending with the finished product being boxed for shipment. A picture of this type is very simple to film, because the continuity or thread of interest logically follows the stages of production. Nevertheless, it is a very good idea to prepare a scenario for the film, listing the scenes necessary to show the audience what is happening in each stage. The titles can be planned at the same time and would follow the same rules of title writing as other types of films. The same continuity factors apply that have been discussed throughout this book—sequences

should be used for each step, because one scene alone will not tell the audience what is happening. The scenario will be very much like a dramatic scenario, the only difference being that a description of the manufacturing action will be substituted for the dramatic action.

Even if the stages of manufacture are few and the film will be short, it is advisable to prepare a scenario, for this provides an opportunity for the analysis of the scenes that will be made. Because of this analysis, one may be sure of doing justice to each important point.

Films of the construction of buildings would follow the same type of continuity—the presentation of the logical development of the work. A film of almost any business can be made on this basis. Lawyers have even shown in film the course taken by cases entering their offices and cooks have shown steps in baking a cake. The activity, whatever it may be, supplies a simple and logical theme for the picture and one needs only to do it justice in filming. Draw liberally on your whole body of continuity information in working out the picture.

When a written plan has been prepared, you may send it to the Amateur Cinema League for comments and suggestions. If you have any trouble in working out a plan, you may write about your problem to the League and the Continuity Consultant will gladly make suggestions for a motion picture treatment.

Second in our classification of business films comes the industrial film record, the purpose of which is to analyze the operations of machines or scientific equipment or, perhaps, the movements of routine workmen. Such films are usually made to discover short cuts in production or to locate faults in operation that slow down the work. Often, time lapse mechanisms and slow motion are required for the analysis. For example, the operation of a steel lathe may give slightly imperfect results, the cause of which cannot be determined by inspection of the lathe in motion, because of its speed.

A slow motion picture may detect the fault. Naturally, films of this type offer little continuity difficulty. If there is an operation in your plant susceptible of motion picture analysis, try it with a slow motion camera. Extraordinary results have been obtained, saving the time of many workmen and a great deal of money.

Third are the films designed to instruct employees or salesmen. Such pictures may be complete stories of the operations of the plant, for the purpose of acquainting representatives with the product they are selling, or they may be detailed analyses of given operations to instruct new workers. Motion pictures have proved to be the fastest and most efficient instructors in teaching new industrial operations.

Fourth, come the films made for the purpose of publicizing or advertising commercial products, organizations or welfare activities. Here, the problem of selecting the proper type of continuity and working it out is paramount.

To a certain extent, the same rules apply to film advertising that apply to all other types of advertising. It is a straightforward sales story, clear, coherent and simple, that is needed. But the film enjoys special advantages that are not possible in other forms of advertising. Chief of these is the power to represent actuality and motion. Perhaps even more important from an advertising viewpoint is the fascination that a motion picture, as such, exercises. It can usually be taken for granted that the film has the audience's attention and that the leisure is had in which to present a strong and telling sales or social welfare argument.

Perhaps the greatest advantage possessed by the motion picture as a publicity medium is the fact that it simulates reality so closely that in people's minds it stands for actuality. A motion picture satisfies the "man from Missouri" and answers the challenge of the common saying, "seeing is believing." A statement that might be questioned in words is accepted if represented in the motion picture. Thus, if a per-

son reads an advertisement, "Permo Percolator tops will not tumble off. You need not hold them in place while pouring coffee," remembering sad past experiences, he may have the feeling best expressed by, "maybe so but probably not." But he who sees the claim demonstrated in motion pictures will be convinced even against his will.

The first step in approaching the production of an advertising or publicity film is to determine the most important purpose to be accomplished by it. A good way to decide this point is, for the moment, to disregard all questions of movie technique and ask oneself the question, "What should this film accomplish?" Is it to sell goods, to create prestige for the firm, to introduce a new idea preparatory to a selling campaign or to educate the public or some particular portion of it to the acceptance of a new idea. This analysis might seem to be a rather obvious suggestion and yet the failure to select the picture's primary purpose and to emphasize it in the continuity has contributed to more wasted footage in industrial and propaganda filming than any other factor. One of the few limitations of the motion picture as a serious medium is that it calls for a definite theme. It is very difficult to be subtle in the straight motion picture.

If two purposes must be considered for a publicity film, it is necessary to make one of them definitely the minor theme. For example, should it be desirable to have a film that would contain direct advertising to sell vacuum cleaners and at the same time publicize electrical household appliances in general, one theme must be made decidedly less emphatic than the other or, otherwise, the film will have little value in either respect, in spite of the fact that the two ideas are not incompatible but mutually inclusive.

Having decided which of the film's purposes is the more important and which will have the greater emphasis, the next step is to consider the type of audience to which the film will be addressed, for this consideration will be an im-

portant factor in determining the continuity. The picture might be intended to be screened for retail dealers, for those who are known to be consumers of the product advertised or for the general public. It might be designed for a limited audience of active prospects or for use as a salesman's accessory. Again the average reaction is that one film should meet all possible needs. Yet one would not plan to send the same written material to dealers as to consumers. Like printed matter, the motion picture must be directed to the type of people it will reach. Select the class of audience that deserves the greatest consideration and address the film to that audience.

Having in mind the film's most important purpose and the type of audience for which it is designed, the next step is to analyze the product or service to be advertised and to determine the sales points to be featured. They might be listed in the order of their importance, although this will not necessarily be their order of appearance in the film. The continuity will embody these sales points, modified by the type of results desired and the type of audience for which the film is made.

The question of whether a dramatic or nondramatic picture will secure the best results will then arise. By dramatic, is meant the advertising film that employs a plot to emphasize its sales points. Often such a film presents the experiences of a prospective customer. It develops that the character in the film faces a problem, more or less serious or troublesome, which might be cured by the use of the merchandise to be offered. The character hears of the product in some way and goes to a retail store to look at it. He is sold by the clerk's arguments which are represented in pictures and the article is purchased. The last sequence shows him using the article, all problems solved and everyone happy. This is a rather trite plot *motif* but it is still useful in some types of advertising.

The continuity of the nondramatic theme is furnished

by titles. The film may consist of a series of statements followed in each instance by a demonstration of the point in a scene or sequence.

The decision as to whether a dramatic or nondramatic theme should be used depends largely upon the product and to some extent on the audience. In many cases dramatic treatment is out of the question. For example, if the article under consideration is a machine to be sold to engineers upon the basis of its efficiency, the best approach would be a simple picturization of the machine's performance under the required conditions. The convenience of the film is substituted for the often difficult attendance at actual tests.

On the other hand, whenever the product can effectively be sold by stimulating the desire of the prospective purchaser, the plot film should be seriously considered. In the plot film, for example, the strongest appeal to sympathy, personal pride or the desire for luxury can be made.

The decisions made in the analysis of the picture will guide one in preparing the continuity outline. If a dramatic film is selected, then the plot would be prepared and the scenario written just as in the case of any other photoplay. If a nondramatic treatment seems best, then the sales points will be listed and sequences and titles will be planned to illustrate them. If it is a welfare picture that is being made, the points the workers find most desirable to emphasize for public information will be listed and the same process will be followed.

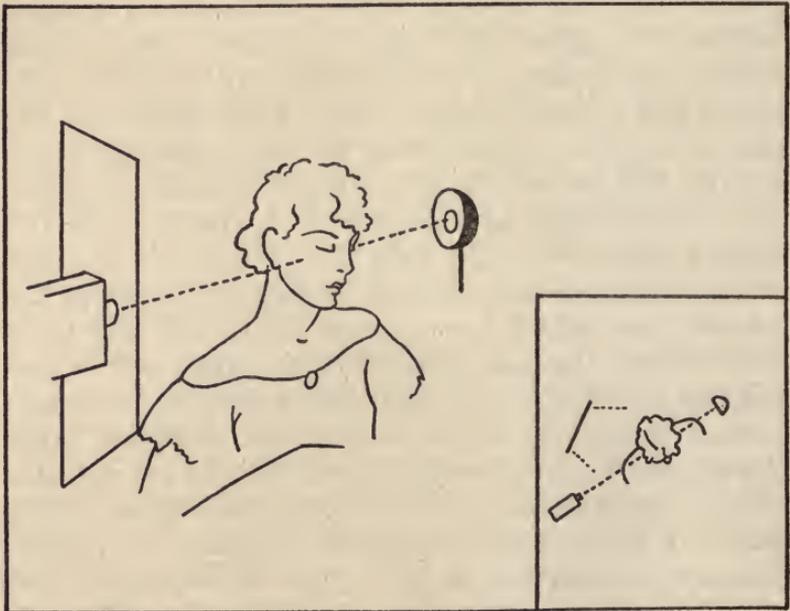
Whether the picture is to be dramatic or nondramatic, the League member may apply to the League's Continuity Consultant for detailed help, either in working out a general treatment or preparing a scenario outline. By all means, send in your scenario outlines before beginning filming, for the comments will be helpful and may simplify the picture making considerably.

CHAPTER V

AHEAD OF THE PROCESSION

Using lights for special effects From the discussion of the fundamentals of interior lighting for home movies, we have seen that the use of a flat light on any subject, coming directly from the front, will produce, in most cases, an effect that is characterless. Lighting from the side of a subject, to aid in modeling and in making the subject stand out from the background, has been covered in the discussion of outdoor filming. It applies with equal or greater force indoors. Professional studios, in almost every interior view, apply strong side or back lighting to the subject and it is to this that so many of the fine effects on the professional screen are due. But, for effective side or back lighting on a subject, more powerful light is necessary and a greater number of lighting units, for, if the light is to come from the rear of the subject or from directly at the side, much of the subject's area which faces toward the camera will be in shade. Thus, the side or back of the subject will be illuminated but not the front. Of course, with reflectors of large surface, whose function has already been described, much can be done to catch the light and to turn it back upon the shadow side of the subject, but, usually, additional lighting units are also needed. These are necessary to provide adequate illumination for the surface of the subject that would otherwise be in shadow. It is sometimes difficult to understand why, with extreme side or back lighting, this

illumination, which only outlines the *rim* of the subject, needs to be so much more powerful than the ordinary front light. The reason is that such rim lighting is effective only when it *contrasts* with the light on the rest of the subject, and in order to secure this contrast, this light must be very much brighter. This result may be produced by the amateur most easily by insuring that the back lighting units be very much closer to the subject than all others. The power of a lighting unit decreases as the square of its distance from the subject; that is, if a unit gives a certain illumination at four feet, it will give only one quarter of that illumination when placed at eight feet, or only twice the distance away. It is often convenient, in closeups, to place the back lighting unit quite close to the subject, so that the latter's head or shoulders hide it from the direct view of the camera. A very interesting aureole effect will



Full back lighting with a reflector. The head conceals the direct source of light and the reflector illuminates the shadow side of the subject.

be produced in this way by a subject that has fluffy hair, as has already been pointed out in the discussion of back lighting with sunlight. The light should not be placed too close, or the subject will feel some discomfort at the back of his or her neck. In addition, the ordinary front lighting should be provided by lights placed farther away.

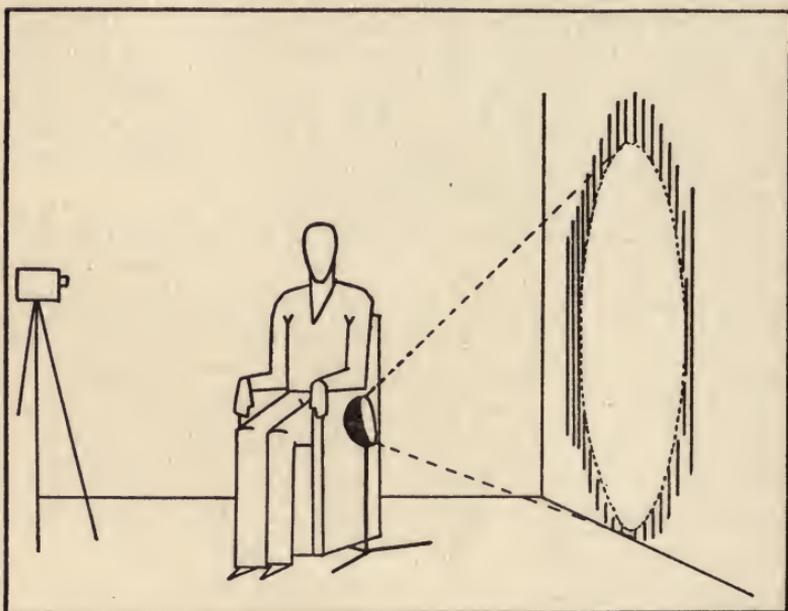
For the most natural effects in closeups of people, it is safest to resort to the tried and true "forty five degree front lighting," with an auxiliary light or reflector to lighten up the shadow side. This lighting is provided by placing the main source of illumination somewhat higher than the subject's head and slightly to his front, so that approximately three quarters of the face will be illuminated by the light rays, which strike the subject at an angle which is approximately forty five degrees to the horizontal.

Interesting tricks may be played with lights; the subject is a complex one and can hardly be discussed completely, except in a book devoted entirely to the subject. A single light, placed low and illuminating the subject from the front, below his eye level, tends to give a sneering, villainish effect. The same light, placed forward of the subject and high over his head, gives an exalted effect. Light psychology is strange. Horizontal light gives a neutral effect, except when made to shine through a window or open door, when it will tend to resemble sunset light. The film may be tinted yellow or amber to abet the effect.

Silhouettes

Of other special lightings, perhaps the most interesting is that of the *silhouette* effect. As its name implies, this effect shows the subject sharply etched in black, without detail, against a background of light. It may be produced in two ways. The first of these is to stretch a wide sheet across a doorway, to place a single lighting unit back of the sheet and to have the subject perform the action be-

tween the light and the sheet, so that the shadow of the subject is cast on the white expanse of cloth. This is photographed directly from the front. The subject should keep close to the sheet, to produce the sharpest shadow possible, and the lens stop should be around $f/4.5$ to $f/5.6$ with a single lighting unit. If the sheet is wet, it will hang more smoothly and will be more translucent. A second and easier way of making silhouette shots is to choose an ex-



Silhouette effect. The entire available light is cast on the light wall back of the subject. There is no light at all on the side of the subject nearest the camera, whose lens is focused on the subject.

pense of blank, white or light colored wall, to arrange the subject and to place the light directly between the subject and the wall, so that the subject shields the light from the camera. The lens should be stopped down to $f/5.6$ or $f/8$, because no detail is wanted but only the mass effect. The light is, of course, so turned that it will illuminate the

surface of the wall and thus provide a uniform, light background against which the subject will appear in black. The movement of the subject must be planned so that it will not reveal the source of light.

Hard and soft light

As a final word concerning the use of artificial light, we should consider the *soft light* and the *hard light*. The latter is produced by any source of light which approaches a point, such as that given by the tubular, projection type of bulb, without a reflector. Hard light is characterized by heavy, deep shadows and a harsh outlining of the features of the subject. Soft light, on the other hand, is gained from a light source such as the Photoflood lamp, placed fairly close to the subject. A soft light is one emanating from a large source instead of from a point. It gives softer shadows and has a generally smoother effect upon the subject, tending to eliminate deficiencies. A hard light may easily be transformed into a soft one by placing before it a diffuser, which may be merely a piece of cheesecloth or chiffon held in a frame. Full diffusion may be had by the use of a piece of draftsman's tracing cloth, but this will cut down the light and the lens must be opened to compensate or the light placed closer to the subject.

Kodacolor indoors

It has been possible to take Kodacolor pictures by artificial light with greater readiness since the new, supersensitive film was introduced for this process. A plurality of Photoflood bulbs should be used and, in most cases, the camera may advantageously be run at half speed. From four to six Photoflood lamps in efficient reflectors should serve and the light had best be directed toward the subject mostly from the front. Unless a special ratio diaphragm

is used, there will be a tendency to emphasize the reds in the picture, when taken with Photoflood lamps. For experimental purposes, this may be eliminated in projection by cutting a cardboard cap to fit over the three color projection filter in such a way that part of the red band is covered. Some amateurs in their interior Kodacolor lighting experiments have made use of the former "K" ratio diaphragm, reversed left for right, and have secured a very pleasing color balance thereby.

Animation

We have seen previously that, as we slow the camera down, a greater and greater length of time will elapse between the exposure of each separate frame. Yet, no matter how great the interval between each frame in taking, in projection the film is always shown at approximately the same rate, so that the gaps are closed up and, therefore, the slower the rate at which the film was taken, the faster the action appears on the screen. Now, if we deliberately arrange our taking operation so as to slow it down into a series of definite, separate pictures, it will be seen that, in the time which occurs between taking one frame and the next, we can alter the position of the subject just as we wish. But, when these successive images are projected on the screen at the usual rate, this alteration of position between one frame and the next will seem to occur spontaneously; it is by this means that we can give an inanimate object *animation*.

We have, then, to discuss the mechanical means whereby animation may be produced. We shall need, first, a source of even illumination. This may best be secured through the use of artificial light, as this is uniform in quality and will remain the same through the whole operation. Second, we must have a camera which will take one frame at a time, dependably. The ordinary, spring driven camera

may be made to serve this purpose surprisingly well, but a little practice is needed in pressing the release button or lever with a quick tap and release, so that only one frame is exposed. This may best be practiced by taking an empty camera, removing the lens from its mount and observing the action of the shutter. In a short period of practice, the knack will be acquired of exposing but one frame at a time. If the camera can be set at half speed, it will help in accomplishing this. Cameras used professionally for animation have a "one turn, one picture" shaft which may be turned by crank or motor and certain 16mm. cameras also have this feature. One small 16mm. camera, which operates on the magazine principle, carries a one picture release button as a special feature. The mechanics of animation are easy with such a camera.

In all animation experiments, the camera should be held at a firm position with relation to the subject and its background. In ordinary work, a good solid tripod should be used for this purpose and, where much of this kind of thing is to be done, an *animation table* may be constructed. This is simply a device, somewhat like an overgrown title maker, designed to hold the camera always in fixed relationship to the subject. It may be arranged so that the single picture release is operated electrically by means of a push button.

Animation is an advanced subject for the average amateur movie maker and requires some care and patience, if the operation is to succeed. Probably the first use of animation will come through the desire to liven up one's titles; a simple example of this kind of animation would be in the title which has movable letters that may be made to march into place by this process. The title maker may be transformed into an animation device for this purpose; if this is done, it is preferable to arrange the title surface so that it is horizontal, the camera being suspended above it. The time in which the animation is to be completed on the

screen is planned out in advance; this time is translated into screen footage, which is, in turn, translated into the actual number of frames required for the animation. From this, it will be seen just how far through its predetermined path any object must be moved between frames, to produce a desired effect of speed on the screen. Animation may be produced with dolls, miniature figures and cutout cartoons on a flat surface; in fact, any inanimate object that may suggest itself to the imagination may be given motion by this means.

Reverse motion

The discussion of animation leads us to other special camera manipulations which produce unusual results and which, for want of a better name, are known as camera tricks. Two of these have been discussed under Reverse Motion (Chapter I) and Double Exposure (Chapter IV). The uses of reverse motion have already been covered; the means of securing the effect are provided simply by holding the camera upside down when shooting. It will be found harder to hold it steady in this way, hence special attention should be given to this. For the ordinary long shots, the finder will function as well upside down as right side up. After the film is processed, it is simply reversed in the reel, end for end, and the motion will appear on the screen backward. In a combination of animation or title making work with reversed motion, it is not necessary that the camera itself be turned upside down; merely turn the object or title upside down with respect to the camera, when the same result will be achieved.

Mirror shots

Very often, it is desired to take a picture in a mirror and, because of the special setting required, this will come under the heading of tricks. If the object reflected in the mirror is

to be sharp, the camera lens must be focused for the distance from camera to mirror PLUS the distance from mirror to object. A great help in this and in many other trick and straight shots is found in the *visual focusing device* or *critical focuser*, as it is sometimes called. This is a ground glass plane, inserted in the path of the lens (usually in some position in the turret head of a camera) which is placed at the same distance behind the lens as is the film. Therefore, when the lens is brought in front of this ground glass, any image focused sharply on the glass will also be in sharp focus on the film, when the lens is returned to its taking position. With a device like this, it is unnecessary to measure focusing distances, and shots like these mirror pictures are easy. A device which works along these same lines is found in the *focus on film* arrangement, which is a prism inserted in the back of the gate in such a way that the image on the film is reflected to the eye as in a mirror. Certain special cameras may be purchased equipped with this device, which is especially useful for tricks and all kinds of particular work. However, its use is strictly limited to those films which do not have the black, non halation coating, as it is, of course, impossible to see through the back of the film under these conditions. Both this and critical focusing devices are provided with magnifiers to make fine work easier with them. Devices of this nature are also of a special advantage in double exposure work. These devices are further developments of the focusing magnifier mentioned in Chapter III under the heading of Distance Meters.

A further auxiliary device which may be used to center the image accurately in all special trick and precision motion picture work is found in the *focusing alignment gauge* which may be adapted to a popular camera. This gauge provides a method for centering any subject with maximum accuracy in the field of the picture and is of great value in all special work of this nature. The fact that it must be used with the aid of a tripod is no drawback; indeed, this is an

indication of the necessity of a steady support for the camera in all of this kind of work. Other devices are also available to accomplish the same purpose with any camera; special ones may be had, made to order.

Distortion effects

Shots of this kind are used chiefly for comedy, or grotesque purposes, and are produced by placing in the path of the lens a supplementary element that will bend the rays of light and produce a picture distorted either horizontally, vertically or both. The introduction of prisms of various sizes and shapes in the path of the lens will produce double, triple or multiple images according to the number of prisms used and the way they are set. The production of distorted photographic images is a very complicated one to discuss, but the problem is solved in a simple way for the amateur by the availability of certain small *distortion* and "displacement" *devices* in metal caps to fit over the barrels of certain lenses. The first will produce hilarious effects in elongation and compression, making the fat lean and the lean fat, while the displacement effect shows two objects on the screen whereas, in actuality, only one was in front of the camera. Trick effects in the movies are legion and, to achieve new ones, the amateur worker may best exercise his imagination. Reverse motion, double exposure and distortion are the principal means used.

Extreme closeups

The technique involved in the photography of subjects very close to the movie camera lens is important, since problems of this nature arise continually in scientific filming of all sorts. It is an optical fact that the closer the object is to the lens, the farther must be the lens from the film; when the object approaches so close to the lens that its distance can be measured in inches, special apparatus is recom-

mended. The ordinary lens does not generally focus closer than one foot, whereas, if it is desired to get a picture of an insect or similar object, so that it will appear large on the screen, it is often necessary to focus more closely than this. In order to accomplish such a result, an *auxiliary extension* is introduced between lens and camera so that the subject may be focused sharply. A very convenient device is available to effect this purpose; this includes a lens extension and a *reflex focusing device* as well, so that the object may be focused sharply prior to taking the picture. This is necessary because, with any lens extension, the regular focusing scale would be inoperative. Such a device may be used with telephoto lenses to achieve the same purpose and is valuable in taking pictures of wary birds or animals. It must also be remembered that, in these very close shots, the lens diaphragm stops do not function at their normal value and that any object which is photographed very close to the lens must receive a definite increase in exposure. Professional photographers increase the exposure four times in a one to one image, that is, when the image on the film is of the same size as the object.

Microcinematography

From here we pass to the subject of recording images *larger* than normal size, which may best be done by taking the picture through some form of microscope. It is not within the scope of this book to discuss microscopic technique, but it may be of value to outline the procedure followed in the arrangement of the simple cine microscopic set up. The ordinary spring driven movie camera may be used in conjunction with a microscope, the lens of the latter serving as a photographic objective; some arrangement should be made to hold the camera rigid, so that the optical axis of the camera coincides with that of the microscope. It is preferable to remove the actual taking lens from the camera, as it will

be found that the microscope lens system will cast an image on the film, if the stage illumination of the microscope is sufficient. The centering of the image on the film is best done by some means of visual focusing in the camera, as has already been outlined. Sub stage illumination in the microscope should be provided by a fairly powerful source of light which can be concentrated on the microscope sub stage condenser. The set up and arrangement may be checked by inserting a piece of matte film in the camera gate and observing the image on this before the camera is threaded. The most convenient means of keeping the subject on the microscope slide centered in the picture is provided by means of the "beam splitter" or demonstration eyepiece which may be applied to some microscopes. Best results are usually had with supersensitive film and sometimes half speed or even stop motion methods will give good results.

Medical and surgical filming

A most interesting development of the motion picture in the service of humanity has been its application to medical filming for instruction and analysis. Case histories of many diseases may be recorded graphically in this way and, in such motion picture records, the technique involved is substantially that for simple interior lighting. Naturally, special back and side lightings would be out of place here and, generally, a full, nearly front lighting will give the effect desired. The use of supersensitive panchromatic film has added greatly to the possibilities of case histories in conditions where the use of an especially brilliant light is not practicable. In other circumstances, the use of the color film will prove invaluable. The technique for this has already been outlined.

In filming motion picture records of operations, the chief requisite is that the picture taking apparatus shall not interfere with the actual clinical necessities. To this end, it is best

to provide some sort of elevated platform or stand for the camera and its operator, well away from the aseptic area. The subject may be made to appear close on the film, by means of a telephoto lens of two or three times magnification. If supersensitive panchromatic film is used, in many cases the ordinary operating light will be sufficient to produce a satisfactory exposure, but, since these lights differ in power, it will probably be best to arrive at a reading in advance, by the aid of a good exposure meter. If necessary, extra illumination could be provided by means of ordinary lighting units placed above the subject. If it is desired to film an important part of the operation in one continuous sequence, it may be best to have two spring driven cameras trained on the subject, so that one may be wound while the other is running, or else to have a hand cranked camera. Where the operation involves a deep cavity, sometimes a heavy shadow will be produced and the inner part of the cavity will appear dark. A small spotlight will afford the most effective means of producing adequate illumination on such a subject. While, of course, the surgeon cannot proceed with the requirements of the camera alone in mind, he should try as far as possible not to interpose his body or arms within the field of view of the lens. This is why it is best to have as high a viewpoint as possible for the camera. So important is this consideration that arrangements have been worked out whereby the camera may be held practically over the heads of the marginal workers, being controlled and wound remotely. Perfect hemostasis is needed to make the picture clear; a bloodstained field will obscure the picture, for blood tends to photograph black.

Sound projection

In view of the fact that the availability of 16mm. *sound film, synchronized both on disc and on film*, is becoming more and more widespread, it is proper that some attention

be given to the special needs of sound projection, so far as these differ from the operation of ordinary "silent" machines. The sound on disc *synchronizing projector* is the one most used at present for synchronized pictures in the home. This consists of two units, the projector itself, which operates in the ordinary way, except at a faster speed, and the *synchronizing turntable*, which is connected directly to the projector. In threading sound and disc synchronized film, the operator should be especially careful, because, if anything goes wrong, it is not a mere matter of stopping and rethreading but of resynchronizing as well, which is practically impossible in the middle of a film. The film, therefore, is carefully threaded at first and the *start frame* (so marked on the film) is centered in the projector gate, where it may be seen on the screen by using the still picture attachment. This having been done, the record or disc is placed carefully on the turntable and the *electric pickup* is brought into engagement with the first groove of the record, which is usually on the inside, nearest the center. Careful inspection will reveal a white dot or arrow marked "START" and the needle of the pickup is placed precisely on the portion of the groove so marked. The record is then affixed to the turntable by turning down the fastening screw at the center spindle. This is done to prevent it from slipping during the running of the film. Both projector and turntable are now set in motion by the operation of a single control and the synchronization of sound and picture will be maintained on the screen unless the record slips or the film breaks. The matter of operating the *amplifier* and connections of the pickup is an electrical question and will not be discussed here. A new needle should be used with every record and the needle in the pickup should not be left resting on the record when the latter is not playing.

In the sound on film machine, no difficulty is experienced with synchronizing, if the film breaks or stops, as it may be rethreaded and the picture and sound will proceed in com-

plete synchronization as before. The threading of such a projector is slightly more complicated than that of a straight, silent one, but the additional work of adjusting the record is quite eliminated. Complete directions for the electrical and mechanical operation of the sound on film projector will accompany the machine and should be studied carefully before proceeding. Sound film should be handled and re-wound carefully to prevent unnecessary scratching.

Filming guides

Of course, every amateur picture should be undertaken with some advance idea of the continuity or theme of interest that will hold the picture together, when it is presented on the screen. Usually, the amateur movie maker will carry a plan in his head and he will modify or adapt it, depending on circumstances, during filming. Many experienced amateurs go a step further and prepare an outline on paper of the picture to be made. This serves as a *filming guide*, just as does a scenario, in the case of an amateur photoplay. Of course, the form is the simplest—merely a list of scenes desired, with informal notations of ideas for camera treatment, angles and other things. Such a list of scenes would be very much like the simplest form of scenario, illustrated in the previous chapter.

Almost every amateur who has several reels to his credit is eager to make one picture to exemplify his best work. He wants to do this particular bit of filming not as a record of the family or of a vacation trip but as a medium for the expression of his own artistic taste. Some of the best amateur work is of this type; the filmer had no other purpose in mind than achieving something superlatively beautiful. Amateur movie contests sometimes furnish occasions for such films and, just as frequently, they are expressions of the movie maker's personal desire.

Such a picture deserves as careful planning as one can

give it. If possible, it is desirable first to visit the scenes that will be photographed and to study camera angles that might be used, sequences which could be worked out and lighting effects that could be secured. Careful notes and a list of scenes will prove invaluable as guides for the actual filming. In working on such pictures, the amateur should carefully follow all of the matters covered in the discussions of continuity and he will find the study of scenarizations in Chapter IV useful, in spite of the fact that his film is not to be a photoplay.

“Faking” scenes to aid continuity

A passion for film veracity controls many movie makers and, accordingly, they do not secure delightful bits of continuity that can easily be worked out with the aid of innocent “faking.” For example, during the filming of a motor boat trip, it might not be practical to stop to get closeups of the engine running, of the boat’s wake, of the wheel in action. A needed near shot of just the boat and the shore, as the boat touches land, might be missing. During the trip, the cameraman had an opportunity to capture many scenes of the party on board, of the shore line and the water, but he missed these closeups that would help so much in sustaining the film’s interest and in providing variety. However, since all of these scenes are closeups, it might be very easy to take a short trip in the boat with a friend the next day and to make these scenes. They could be spliced into the reel in the proper places and, of course, no one would know that they had not been made during the original trip.

Such “faking” has unlimited possibilities. Complete and clever film stories have been made in this way from the most ordinary groups of shots. One or two “faked” scenes—especially closeups—will help almost any reel. Naturally, it is not always practicable to obtain them, but it is worth while to use your imagination in looking for opportunities.

Symbolism

Closeups often have more than an ordinary value. They may be used to symbolize general ideas and to add emphasis to themes. A very simple illustration is furnished by the closeup of bells ringing in a wedding film. Although the picture may be presented very clearly without this closeup, it does add a certain "punch" to the picture, because, in itself, it symbolizes the whole story of a wedding. A closeup of a man wildly cheering during a football game may tell the whole story of the grandstand's enthusiasm over a play. Spliced into a scene of the grandstand cheering, it certainly will add emphasis to the idea. We may go even a step farther and show a semi closeup of the "rooter" unconsciously pounding the hat of a man seated in front of him. Instances of *symbolism* abound in our daily lives and conversation and it is remarkable that it is not used much more in picture making. A well chosen symbol will add emphasis to any idea on the screen.

Symbolization is very valuable in dramatic filming. For example, a slightly stupid and self satisfied character would immediately be characterized, for the audience, by following a scene of him by a shot of a highly contented cow, grazing in the meadow.

Montage

Montage, a French motion picture term, meaning editing, is used professionally to indicate highly specialized cutting. Broadly speaking, it refers to a series of very short scenes or *flashes* which provides a cumulative effect in telling a story or symbolizing an idea. The technique is very familiar to one who has seen any Russian photoplays, for the very dramatic effects that may be achieved through it are useful in propaganda. The following series of scenes illustrates the use of the principle of montage: A man enters a room. He sees his wife in the arms of another man. Flash of a semi closeup of the wife's and lover's faces. Flash of

husband's face. Flash of wife's face. Flash of a porcelain cat lying curled up before the fire. Flash of husband's face. Flash of a heavy vase. Flash of husband's face as he walks toward the camera. Flash of vase in his hands as he swings it. Flash of lover lying on the floor, the vase shattered beside his head. Flash of wife's face. Flash of china cat, quietly immobile. The scenes are very short—scarcely two feet and, in some cases, shorter. The rapidity and the fleeting glimpses of the expressions of the actors dramatically build up the horror of the tragedy. The very short flashes are much more emphatic than would be a more prosaic medium shot of the whole action. The motionless china cat contrasts the tragedy with humdrum life that is going on around it. The idea has been adopted by the Hollywood producers and current photoplays often present examples.

Not infrequently, montage employs the familiar principles of contrast and comparison. In editing, a shot of an impressive Fifth Avenue window might be placed immediately before the scene of a poverty stricken mother feeding her child. The two scenes comment on each other and inevitably bring an association of the two ideas, wealth and poverty. The principle is very useful in photoplays and may be used in scenic and travel pictures.

Tempo

Tempo is a word so vaguely used as to obfuscate the clearest thinker. It is small wonder that, when it is mentioned, amateur movie makers look polite and wait for the picture making conversation to shift to other channels. Yet, in essence, motion picture tempo is a very simple concept. Sometimes, it is desirable to produce an effect of rapidity on the screen and sometimes an effect of leisureliness fits the spirit of the film. Although the subject matter, itself, provides the basis of the effect, it is from timing the scenes, in editing, that the real emphasis comes. One may leave certain scenes longer to give the effect of a slow

tempo and cut other scenes shorter to produce a rapid tempo. Long scenes slow the tempo down and short scenes speed it up. For instance, in a picture of the sea, a portion of the film might be planned to show the placid beauty of the water. In this part of the picture, the scenes would all be fairly long, to build up the effect of calm beauty. Then a storm arises and the scenes would grow shorter and shorter, as the fury of water and wind increases, ending with the climax of the storm. Then, again, with the calm, the scenes would grow longer and the tempo of the picture would slow down. Tempo is achieved largely by trimming the scenes in editing. For example, in the illustration above, the amateur might have made, actually, some fairly lengthy scenes of the climax of the storm, but, in editing, he would cut them down. Tempo is an important consideration in dramatic pictures and in special films offered as amateur film artistry, but, in the average picture, the rough approximation of the effect that comes by second nature to the experienced film editor is sufficient. However, there are few phases of movie making that are so little explored as this one and the experienced movie maker would be rewarded by some remarkable effects if he would undertake a short film, planning and editing it with a view to enhancing the subject matter by carefully controlled tempo.

Composition

A rudimentary discussion of composition has been given in an earlier chapter and the "do's" and "don'ts" might be summed up here. 1. *Don't select a viewpoint that causes the horizon to bisect the picture.* 2. *Be sure that there is a pleasant foreground as well as background in the picture.* Foreground objects lend depth to the scene and extremely beautiful effects may be obtained by including moving objects in the foreground. 3. *Break up an open stretch of land or water with some object off center in the foreground.* 4. *When practicable and suitable, frame views of the distance*

and middle distance through trees, arches, avenues of buildings, etc.

To these may be added a warning to avoid flat, empty seascapes and landscapes in general. Very frequently, with the aid of filters, such scenes can be made very pleasant by masses of clouds. However, some object is always helpful in the composition; it might be a boat or head of land in a water scene or a clump of trees in a picture of rolling plains.

Probably the largest number of indifferent amateur movie compositions come from the amateur's lack of care in selecting a viewpoint that permits a pleasant balance of elements of the picture in the foreground. Many filmers, on board ship, for instance, will take very ordinary views of the sea, when distinguished scenes might be made by stepping a few paces back or to one side to include a portion of the ship's ventilator on one side of the frame and the white top of a hatch at the bottom.

Movement is important in a good motion picture composition, especially foreground movement. If we add to the composition discussed in the preceding paragraph a girl standing at the ship's rail, with the ends of her scarf fluttering in the breeze, at once we bring in both a human touch and attractive motion.

An experienced movie maker recommends cutting a square hole, movie frame proportions, in a piece of heavy cardboard and carrying this cardboard on every filming expedition. She advises studying possible camera viewpoints through the cardboard to examine balance of masses, rhythm of line and the perspective of the view. The square hole in the cardboard gives a rough approximation of what the camera will register and is much more convenient to work with, in a preliminary study of possibilities, than would be the camera's viewfinder. The card can be carried habitually and composition may be studied when the camera is not along.

A careful and critical study of one's friends' and one's own movies, as well as of attractive still photographs and paintings, will do more than anything else to build up a ready consciousness of beautiful composition and how to obtain it, while making pictures.

Kodacolor continuity

Kodacolor films may be planned as any other films but, since the usual amateur practice is to limit Kodacolor work to certain types of subjects, they may be given a special word. Nine out of every ten Kodacolor pictures are films of flowers or sunsets. Such subjects, beautiful as they may be, are very limited, while Kodacolor is limited only by the necessity of favorable light conditions. Try a boating picture in Kodacolor! The blue water, the bright clothing and the waving pennants make beautiful subjects. If you are not a boating enthusiast, try an ocean trip in Kodacolor, a vacation record, a sport film and even a city study. Novelty in Kodacolor film is always appreciated and a wealth of subjects remains to be tried. Beautiful bits of color combined with action may be found in the most surprising places. A most effective scene may be made of a friend selecting a periodical at a magazine stand. The "zoo" offers surprisingly effective subjects, as do even prosaic shop windows.

Most color films are splurges of color, because few realize that the most effective shots are achieved by controlling color. A girl gowned in delicate shades of blue would be lost in the riot of color of a summer flower garden but, against the more sober background of a city street, she would stand out as the dominant element of the picture. Select the less colorful backgrounds for Kodacolor portrait shots and, generally, avoid too much color in a scene, if you want the most effective screen results.

Editing from odd shots

Two or three years of movie making invariably mean several reels of "pot shots" in the movie maker's library. From these, if he desires, the amateur may edit some remarkably amusing films. If the collection extends over several years, a "then and now" film could be compiled. In this picture, the fashions of dress of members of the family, a few years ago, could be contrasted with the current vogue. The family car of a few years before could be compared with the present model. Hobbies of the youngsters change; Bobbie's devotion to his stamp collection would be contrasted with a scene showing his present interest in the girl across the street. Comedy newsreels may be worked out, in which titles furnish the fun. More serious films may be undertaken, for the amateur movie maker may find that he has collected material for a very fine picture in his stray shots.

Another stunt that makes it possible to get increased value from older films is to reedit earlier pictures. Later experience has given one greater facility in editing and a better understanding of movies altogether. By taking advantage of this experience, earlier travel films, vacation reels and scenic pictures may be made into something entirely new. The rearrangement of the scenes will make the picture seem completely different to an audience that is very familiar with it. Try it some time. Remember that, outside of the family records and other similar pictures, the old amateur movie film is not precious except as it amuses yourself and your friends. If you can make something new from it, do not hesitate to slash and cut wherever necessary.

Scientific and medical film planning

Makers of scientific and medical pictures are sometimes inclined not to devote to them the detailed advance planning that they require. But scientific films deserve just as

much consideration from every angle as do entertainment pictures.

In medicine, many important fields are denied to the camera because they are not adaptable. Subjective symptoms are often the most important elements in a case and subjective symptoms cannot be filmed. The attempt to picture a patient who appears perfectly normal and to describe the illness in the titles means bad and, therefore, inefficient motion picture technique. It is important to select only those medical and scientific subjects that are susceptible to motion picture treatment.

In filming operations, cameraman and surgeon should hold a conference in advance. A mutual understanding of what is to take place will result in the choice of the best camera viewpoint.

Telephoto closeups should be used exclusively during the actual surgery. Medium shots, normal closeups and semi closeups will help to tell the story of the selection of instruments and, often, important action on the sidelines, but, in filming the actual operation, the view should be as close as possible.

Equal care in advance planning should be taken in other scientific films. Laboratory technique requires very near closeups, just as does surgery. In all cases, first establish the general field of operation and, with it, the idea of what is about to be done. Then follow the detailed action in closeups. It is difficult to say which is the more important—establishing the idea of the sequence or the series of closeups. The thought would be equally obscured by missing either.

Special continuity help is available from the Amateur Cinema League to those members who are planning medical, scientific or teaching films. Be sure to take advantage of it before tackling the actual camera work.

HOW TO USE THE AMATEUR CINEMA LEAGUE

At every step on the highway of movie making, Amateur Cinema League members are urged to enlist the League's aid. A postcard query on an exposure problem, on how to make titles or how to arrange a lighting set up will bring immediate and full response, personally prepared for you. Members may request ideas for family films, travel pictures, business films, photoplays or any type of picture that they wish to undertake. Service is available on everything covered by this book; to list all of the topics would be merely a recapitulation of this volume.

If you will send in a film, a full discussion of it, both from the technical and continuity departments, will be sent to you. Frank criticism of errors and faults will help you to avoid these same difficulties in your next picture. Editing and titling suggestions will be given and, if you like, title wordings will be supplied. The services of the League in these connections can be greatly facilitated by some advance cooperation from members. Where a film is sent in for examination and comment and there arrives at League headquarters merely so much footage containing dozens of scenes, the League's consultants are prevented from giving their best service. If the film's owner will send with it a brief statement showing *what the film is intended to accomplish* (that is, does it constitute a family picture, a vacation reel, a travel reel, a newsreel, etc.) *where the film's action is laid* (geographical location cannot well be guessed from costumes and architecture) and, if the scenes in the footage

are taken in many different places, as in the record of a motoring tour, *what scenes are laid in what places*, the League's consultants can comment upon it with a vastly surer touch. Where title wordings are desired, it will be most helpful if you will send a few of your own suggestions as to wordings, in order that the League may follow your taste, in general.

Certain of the League's aids are not represented in this book. The Amateur Cinema League is a source for information about the use of 16mm. film in many phases. Questions on film copyright, customs duties on equipment and film, legal filming restrictions or similar problems will be answered for League members. Discussions of the availability of special equipment and advice on how to get special effects or how to build devices for getting them may be had. The League has detailed data on a number of very specialized fields of movie making, such as stop motion analysis, scientific filming and under water picture making. While these and other special interests are not sufficiently common to warrant extended discussion in this book, a letter to League headquarters will bring to a member the desired data. Exact service will be more quickly given to you, in such matters, if you will, in discussing any problem pertaining to your equipment or to things that you wish to add to your equipment and in requesting detailed technical help in using your equipment to accomplish special purposes, give, in your letter, very complete data as to what equipment you have. A query, "How do I use lenses?" is so broad that you cannot expect exact aid, while one, "How can I best use my $f/1.9$ lens, on my camera in making titles?" gives the League's technical department exact information upon which to base its reply.

The Amateur Cinema League publishes bulletins and booklets on special topics and any member may receive part or all of them upon request. An application to have all bulletins sent will place the member on a special list

which will assure their being sent to him automatically as they are published.

The League has special aids for amateur movie clubs, both organizations of amateur cameramen who have banded together to exchange ideas and those groups that have been formed to produce amateur photoplays. For such clubs, the League operates an exchange system for club productions, publishes special bulletins on club programs and organization problems and conducts a special consulting bureau.

The League publishes periodically, for those members who desire it, a list of League members who are willing to exchange their films on loan with other members. Any member may list pictures for such exchanges and he will receive the addresses of other members who are willing to exchange films with him. Unless you are willing to list films for such exchange, you cannot receive this list of members, as this is designed to be a strictly mutual service and the list is circulated only among the names thereon.

The League is a source for information about library films and special subjects that have been reduced from 35mm. film to 16mm. Records are kept of films released on 16mm. and questions as to the availability of various pictures will be answered. Although the League cannot promise certainty in discovering the availability of a given picture or subject, it has probably collected the greatest amount of information on this matter that can be secured anywhere. This service, being very much in demand from groups making professional or commercial use of it, is restricted entirely to League members and will not be given to non members.

The League has performed and expects in future to perform services of benefit to movie making and amateur filmers in general. It was responsible for the existing provision of the United States tariff act, whereby amateur films made on raw stock manufactured in this country

may be brought into the United States duty free under certain conditions. It has also been instrumental in removing filming restrictions in certain national shrines, buildings, parks and the like.

MOVIE MAKERS, the League's monthly publication is sent to all members. In it, the League attempts to cover every amateur's interest and to present the latest information about equipment, film and amateur achievement.

In order to conserve postage expense and to prevent waste of material, the League's publications, with the exception of MOVIE MAKERS, are not sent to League members automatically. A postcard request will bring any or all of them to any member. The League tries to make all of its services easily accessible to its members but it avoids forcing these services upon members, unasked. Convenient service blanks are provided and members are invited to make full use of them and to send in questions of any kind to the League's consultants.

Your membership entitles you to definite and specific aid; the League wants you to get that aid. Your part is only to ask for it specifically and clearly. The Amateur Cinema League does the rest.

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